

TEXT SEARCHABLE DOCUMENT - 2009

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Data Requirement:	PMRA Data Code: 9.8.4 (TGAI) or 9.8.6 (EP)
	EPA DP Barcode: DP349851
	OECD Data Point: II A 8.12 (TGAI) and III A 10.8.1.1 (EP)
	EPA Guideline: OPPTS 850.4250 (123-1b)

Test material: BAS 800 02 H

Purity: 12.0% (wt/wt)

Common name: Saflufenacil

Chemical name: IUPAC: N'-[2-chloro-4-fluoro-5-(3-methyl-2,6-dioxo-4-(trifluoromethyl)-3,6-dihydro-1(2H)-pyrimidinyl)benzoyl]-N-isopropyl-N-methylsulfamide

CAS name: Not Reported

CAS No.: 372137-35-4

Synonyms: None Reported

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Date: 04/06/08

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Company Code: BAZ
Active Code: SFF
Use Site Category: 13 (terrestrial feed crops) and 14 (terrestrial food crops)
EPA PC Code: 118203

CITATION: Porch, J.R., H.O. Krueger, K.H. Martin and C. Holmes. 2007. BAS 800 02 H: A Toxicity Test to Determine the Effects of the Test Substance on Vegetative Vigor of Ten Species of Plants. Unpublished study performed by Wildlife International, Ltd., Easton, MD. Laboratory report number 147-229. Study sponsored by BASF Corporation, Research Triangle Park, NC. Study completed December 6, 2007.

DISCLAIMER: This document provides guidance for EPA and PMRA reviewers on how to complete a data evaluation record after reviewing a scientific study concerning the acute toxicity of a pesticide to terrestrial vascular plants. It is not intended to prescribe conditions to any external party for conducting this study nor to establish absolute criteria regarding the assessment of whether the study is scientifically sound and whether the study satisfies any applicable data requirements. Reviewers are expected to review and to determine for each study, on a case-by-case basis, whether it is scientifically sound and provides sufficient information to satisfy applicable data requirements. Studies that fail to meet any of the conditions may be accepted, if appropriate; similarly, studies that meet all of the conditions may be rejected, if appropriate. In sum, the reviewer is to take into account the totality of factors related to the test methodology and results in determining the acceptability of the study.



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EXECUTIVE SUMMARY:

The effect of BAS 800 02 H (formulation containing the active ingredient Saflufenacil) on the vegetative vigor of monocot (corn, *Zea mays*; onion, *Allium cepa*; ryegrass, *Lolium perenne*; and wheat, *Triticum aestivum*) and dicot (bean, *Phaseolus vulgaris*; cabbage, *Brassica oleracea*; lettuce, *Lactuca sativa*; oilseed rape, *Brassica napus*; soybean, *Glycine max*; and tomato, *Lycopersicon esculentum*) crops was studied at varying nominal application rates. Bean, lettuce, soybean and tomato seeds were treated with nominal application rates of 0 (negative and adjuvant controls), 0.000011, 0.000044, 0.00018, 0.00070, 0.00277 and 0.0116 lbs a.i./A (equivalent to 0 (controls), 0.012, 0.049, 0.20, 0.78, 3.1, and 13 g a.i./ha, respectively). Measured application rates for bean and lettuce were 0 (controls), 0.000012, 0.000037, 0.00012, 0.00053, 0.0022 and 0.0092 lbs a.i./A (equivalent to 0 (controls), 0.013, 0.041, 0.13, 0.60, 2.4, and 10 g a.i./ha, respectively). Measured application rates for soybean and tomato were 0 (controls), 0.000012, 0.000066, 0.00028, 0.0011, 0.0031 and 0.013 lbs a.i./A (equivalent to 0 (controls), 0.013, 0.073, 0.32, 1.2, 3.5, and 14 g a.i./ha, respectively). Onion seeds were treated with nominal application rates of 0 (negative and adjuvant controls), 0.00034, 0.0014, 0.0056, 0.022 and 0.089 lbs a.i./A (equivalent to 0 (controls), 0.39, 1.6, 6.3, 25, and 100 g a.i./ha, respectively); measured application rates were 0 (controls), 0.00067, 0.0020, 0.0056, 0.026 and 0.074 lbs a.i./A (equivalent to 0.75, 2.2, 6.3, 29, and 83 g a.i./ha, respectively). Cabbage and oilseed rape seeds were treated with nominal application rates of 0 (negative and adjuvant controls), 0.0014, 0.0028, 0.0056, 0.011, 0.022 and 0.044 lbs a.i./A (equivalent to 0 (controls), 1.6, 3.1, 6.3, 13, 25, and 50 g a.i./ha, respectively); measured application rates were 0 (controls), 0.0013, 0.0027, 0.0052, 0.0096, 0.020 and 0.038 lbs a.i./A (equivalent to 0 (controls), 1.5, 3.0, 5.8, 11, 22, and 43 g a.i./ha, respectively). Wheat seeds were treated with nominal application rates of 0 (negative and adjuvant controls), 0.0011, 0.0033, 0.0098, 0.029 and 0.089 lbs a.i./A (equivalent to 0 (controls), 1.2, 3.7, 11, 25, and 100 g a.i./ha, respectively); measured application rates were 0 (controls), 0.00023, 0.0029, 0.0022, 0.0174 and 0.074 lbs a.i./A (equivalent to 0 (controls), 0.3, 3.3, 2.4, 19, and 83 g a.i./ha, respectively). Ryegrass seeds were treated with nominal application rates of 0 (negative and solvent controls), 0.022, 0.045, 0.089, 0.18 and 0.36 lbs a.i./A (equivalent to 0 (controls), 25, 50, 100, 200, and 400 g a.i./ha, respectively); measured application rates were 0 (controls), 0.026, 0.041, 0.074, 0.16 and 0.31 lbs a.i./A (equivalent to 29, 46, 83, 183, and 344 g a.i./ha, respectively). Corn seeds were treated with nominal application rates of 0 (negative and adjuvant controls), 0.0028, 0.0056, 0.012, 0.022, 0.045 and 0.089 lbs a.i./A (equivalent to 0 (controls), 3.1, 6.3, 13, 25, 50, and 100 g a.i./ha, respectively); measured application rates were 0 (controls), 0.0027, 0.0052, 0.010, 0.020, 0.039 and 0.075 lbs a.i./A (equivalent to 0 (controls), 3.0, 5.8, 12, 22, 44, and 84 g a.i./ha, respectively). The growth medium used in the test was natural soil, classified as a sandy loam, with a pH of 7.2 and an organic matter content of 1.3%. On Day 21 the surviving plants per pot were recorded and cut at soil level for measuring the plant height and dry weight.

In the vegetative vigor test, the plant dry weight and plant height were affected by BAS 800 02 H treatment. Onion was the most sensitive monocot, based on dry weight, with NOAEC, EC₂₅ and EC₅₀ values of 0.0020, 0.003 and 0.0047 lbs a.i./A, respectively (equivalent to 2.2, 3.40, and 5.29 g a.i./ha, respectively). Tomato was the most sensitive dicot, based on dry weight, with NOAEC, EC₂₅ and EC₅₀ values of 0.000066, 0.0001 and 0.0002 lbs a.i./A, respectively (equivalent to 0.073, 0.1508, and 0.2615 g a.i./ha, respectively).

Treatment-related phytotoxic effects were observed for all species, except wheat, which only exhibited sporadic phytotoxic effects. Observed effects included necrosis, leaf curl, stem curl, chlorosis and wilt. All surviving cabbage seedlings in the treatment groups exhibited phytotoxic effects. Soybean was observed with insect damage.

Maximum Labeled Rate: Not Reported

Results Synopsis

Monocot

EC₀₅/IC₀₅: 0.0004 lbs a.i./A (0.408 g a.i./ha)

95% C.I.: 1.2x10⁻⁵-0.0029 lbs a.i./A (0.0138-3.27 g a.i./ha)

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EC₂₅/IC₂₅: 0.003 lbs a.i./A (3.40 g a.i./ha)

95% C.I.: <0.0000-0.0041 lbs a.i./A (<0.0000-4.54 g a.i./ha)

EC₅₀/IC₅₀: 0.0047 lbs a.i./A (5.29 g a.i./ha)

95% C.I.: 0.0031-0.009 lbs a.i./A (3.49-10.1 g a.i./ha)

NOAEC: 0.0020 lbs a.i./A (2.2 g a.i./ha)

Slope: N.D.

Std err: N.D.

Most sensitive monocot: Onion

Most sensitive parameter: Dry Weight

Dicot

EC₀₅/IC₀₅: 0.000036 lbs a.i./A (0.0404 g a.i./ha)

95% C.I.: <0.000-0.0001 lbs a.i./A (<0.000-0.1098 g a.i./ha)

EC₂₅/IC₂₅: 0.0001 lbs a.i./A (0.1508 g a.i./ha)

95% C.I.: 0.0001-0.0002 lbs a.i./A (0.0783-0.1932 g a.i./ha)

EC₅₀/IC₅₀: 0.0002 lbs a.i./A (0.2615 g a.i./ha)

95% C.I.: 0.0002-0.0003 lbs a.i./A (0.215-0.3159 g a.i./ha)

NOAEC: 0.000066 lbs a.i./A (0.073 g a.i./ha)

Slope: N.D.

Std err: N.D.

Most sensitive dicot: Tomato

Most sensitive parameter: Dry Weight

This toxicity study is classified as **ACCEPTABLE** to **U.S. EPA** and **FULLY RELIABLE** to **PMRA and APVMA** as it is scientifically sound and satisfies the guideline requirement for a tier II terrestrial plant vegetative vigor toxicity study.

Table 1. Summary of most sensitive parameters by species (lbs a.i./A and g a.i./ha).

Species	Endpoint	NOAEC	EC ₀₅	EC ₂₅	EC ₅₀
Corn	Dry Weight	0.0027 / 3.0	0.0032 / 3.56	0.0053 / 5.89	0.017 / 19.0
Onion	Dry Weight	0.0020 / 2.2	0.0004 / 0.4082	0.0030 / 3.40	0.0047 / 5.29
Ryegrass	Dry Weight	0.026 / 29	0.0051 / 5.77	0.0257 / 28.8	0.0478 / 53.5
Wheat	Dry Weight	0.00023 / 0.3	0.0011 / 1.28	0.0071 / 7.97	0.0415 / 46.5
Bean	Plant Height	0.00012 / 0.13	0.000017 / 0.019	0.00018 / 0.202	0.00096 / 1.08
Cabbage	Dry Weight	<0.0013 / <1.5	0.0003 / 0.3221	0.0015 / 1.66	0.0043 / 4.81
Lettuce	Dry Weight	0.00012 / 0.13	0.000066 / 0.0741	0.0002 / 0.2144	0.0004 / 0.3969
Oilseed Rape	Dry Weight	0.0027 / 3.0	0.0012 / 1.34	0.0050 / 5.63	0.0130 / 14.5
Soybean	Plant Height	0.00028 / 0.32	0.00004 / 0.047	0.00058 / 0.6497	0.0036 / 4.03
Tomato	Dry Weight	0.000066 / 0.073	0.000036 / 0.0404	0.0001 / 0.1508	0.0002 / 0.2615

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED:

This study was conducted following guidelines outlined in the U.S. Environmental Protection Agency Series 850- Ecological Effects Test Guidelines OPPTS Number 850.4150 and 850.4250. The following deviations from OPPTS 850.4250 were noted:

1. The geographic location, depth of collection, CEC and moisture content of the test soil were not specified.
2. Percent recoveries for wheat ranged from 21 to 89% of nominal, resulting in a shift of the application rates based on the measured values relative to the nominal application rates.
3. Observations of height and plant condition for one bean plant (nominal treatment level 0.012 lbs a.i./A

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[13 g a.i./ha], replicate D, plant 4) were inadvertently not made on day 14 (Appendix 2, pg. 39). This deviation does not impact the integrity of the study.

4. Due to significant inhibitions at all treatment levels for cabbage dry weight, the reviewer was unable to determine the NOAEC value as it was less than the lowest measured application rates. Although a definitive NOAEC value could not be defined, EC₀₅ and EC₂₅ values were derived for the cabbage dry weight endpoint for risk assessment purposes.

These deviations do not impact the acceptability of the study.

COMPLIANCE:

Signed and dated No Data Confidentiality, GLP and Quality Assurance statements were provided. This study was conducted in compliance with Good Laboratory Practice Standards as published by the U.S. Environmental Protection Agency in 40 CFR Part 160, 17 August 1989; OECD Principles of Good Laboratory Practice (ENV/MC/CHEM (98) 17); and Japan MAFF, 11 NohSan, Notification No. 6283, Agricultural Production Bureau, October 1, 1999, with the following exception: periodic analyses of water and soil for potential contaminants were performed using a certified laboratory and standard U.S. EPA analytical methods.

A. MATERIALS:

1. Test Material

BAS 800 02 H (formulation containing Saflufenacil)

Description:

A Liquid

Lot No./Batch No. :

1613-91

Purity:

12.0% (wt/wt)

Stability of compound under test conditions:

Samples from the adjuvant control on two of the three sampling days indicated the presence of a co-eluting substance at the characteristic retention time of the test substance. The measured values for affected samples in the two time intervals were corrected for the contribution from the co-eluting adjuvant peak. No test material was detected in negative control samples. Recoveries from the samples collected on 08/22/07 ranged from 21 to 196% of nominal. Recoveries from the samples collected on 08/24/07 and 10/23/07 ranged from 76 to 110% of nominal.
(OECD recommends chemical stability in water and light)

Storage conditions of test chemicals:

Stored at ambient room conditions without exposure to sunlight.

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Table 2. Physical/chemical properties of BAS 800 02 H.

Parameter	Values	Comments
Water solubility at 20°C	Not Reported	
Vapor pressure	Not Reported	
UV absorption	Not Reported	
pKa	Not Reported	
Kow	Not Reported	

2. Test organism:

Monocotyledonous species: Corn (*Zea mays*, Family Poaceae, Mandan Bride), Onion (*Allium cepa*, Family Liliaceae, WI 301), Ryegrass (*Lolium perenne*, Family Poaceae, Manhattan 4) and Wheat (*Triticum aestivum*, Family Poaceae, Polk); EPA recommends four monocots in two families, including corn.

Dicotyledonous species: Bean (*Phaseolus vulgaris*, Family Fabaceae, Dark Red Kidney), Cabbage (*Brassica oleracea*, Family Brassicaceae, Late Flat Dutch), Lettuce (*Lactuca sativa*, Family Asteraceae, Summertime), Oilseed Rape (*Brassica napus*, Family Brassicaceas), Soybean (*Glycine max*, Family Fabaceae, Williams 82) and Tomato (*Lycopersicon esculentum*, Family Solanaceae, Rutgers); EPA recommends six dicots in four families, including soybean and a root crop.

OECD recommends a minimum of three species selected for testing, at least one from each of the following categories: Category 1: ryegrass, rice, oat, wheat, and sorghum; Category 2: mustard, rape, radish, turnip, and Chinese cabbage; Category 3: vetch, mung bean, red clover, fenugreek, lettuce, and cress.

Seed source: Corn and wheat seeds were obtained from Johnny's Selected Seeds, Winslow, ME. Onion seeds were obtained from Wannamaker Seeds, St. Matthews, SC. Ryegrass, bean, cabbage and tomato seeds were obtained from Meyer Seed Co., Baltimore, MD. Lettuce seeds were obtained from Territorial Seed Company, Cottage Grove, OR. Oilseed rape seeds were obtained from Seedland Inc., Wellborn, FL. Soybean seeds were obtained from Missouri Foundation Seeds, Columbia, MO.

Prior seed treatment/sterilization: None reported

Historical % germination of seed: 85-98%

Seed storage, if any: No storage was reported

B. STUDY DESIGN:

1. Experimental Conditions

- a. Limit test: N/A- test was conducted under Tier II conditions.
- b. Range-finding study: No range-finding data were provided.
- c. Definitive Study

Table 3: Experimental Parameters - Vegetative Vigor

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
Duration of the test	21 Days	<i>Recommended test duration is 14-21 days.</i>
Number of seeds/plants replicate	5 seedlings/rep	<i>Five plants per replicate are recommended.</i>
Number of plants retained after thinning	5 seedlings/rep; the number of seedlings prior to thinning was not reported	
<u>Number of replicates</u> Control: Adjuvant control: Treated:	6 6 6/level	<i>Four replicates per dose are recommended</i>

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
<u>Test concentrations (mg ai/kg soil and g ai/ha)</u>		
Nominal:	<u>Bean, Lettuce, Soybean and Tomato:</u> 0.000011, 0.000044, 0.00018, 0.00070, 0.00277 and 0.0116 lbs a.i./A (0.012, 0.049, 0.20, 0.78, 3.1, and 13 g a.i./ha)	Measured doses were based on the measured test solution concentrations (application volumes were not considered).
Measured:	<u>Bean and Lettuce:</u> 0.000012, 0.000037, 0.00012, 0.00053, 0.0022 and 0.0092 lbs a.i./A (0.013, 0.041, 0.13, 0.60, 2.4, and 10 g a.i./ha)	
Measured:	<u>Soybean and Tomato:</u> 0.000012, 0.000066, 0.00028, 0.0011, 0.0031 and 0.013 lbs a.i./A (0.013, 0.073, 0.32, 1.2, 3.5, and 14 g a.i./ha)	
Nominal:	<u>Onion:</u> 0.00034, .0014, 0.0056, 0.022 and 0.089 lbs a.i./A (0.39, 1.6, 6.3, 25, and 100 g a.i./ha)	
Measured:	0.00067, 0.0020, 0.0056, 0.026 and 0.074 lbs a.i./A (0.75, 2.2, 6.3, 29, and 83 g a.i./ha)	
Nominal:	<u>Cabbage and Oilseed Rape:</u> 0.0014, 0.0028, 0.0056, 0.011, 0.022 and 0.044 lbs a.i./A (1.6, 3.1, 6.3, 13, 25, and 50 g a.i./ha)	
Measured:	0.0013, 0.0027, 0.0052, 0.0096, 0.020 and 0.038 lbs a.i./A (1.5, 3.0, 5.8, 11, 22, and 43 g a.i./ha)	
Nominal:	<u>Wheat:</u> 0.0011, 0.0033, 0.0098, 0.029 and 0.089 lbs a.i./A (1.2, 3.7, 11, 25, and 100 g a.i./ha)	
Measured:	0.00023, 0.0029, 0.0022, 0.0174 and 0.074 lbs a.i./A (0.3, 3.3, 2.4, 19, and 84 g a.i./ha)	
Nominal:		

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
		<i>Five test concentrations should be used with a dose range of 2X or 3X progression</i>
<u>Nominal:</u> <u>Measured:</u>	Ryegrass: 0.022, 0.045, 0.089, 0.18, and 0.36 lbs a.i./A (25, 50, 100, 200, and 400 g a.i./ha) 0.026, 0.041, 0.074, 0.16, and 0.31 lbs a.i./A (29, 46, 83, 183, and 344 g a.i./ha)	
<u>Nominal:</u> <u>Measured:</u>	Corn: 0.0028, 0.0056, 0.012, 0.022, 0.045, and 0.089 lbs a.i./A (3.1, 6.3, 13, 25, 50, and 100 g a.i./ha) 0.0027, 0.0052, 0.010, 0.020, 0.039, and 0.075 lbs a.i./A (3.0, 5.8, 12, 22, 44, and 84 g a.i./ha)	
<u>Method and interval of analytical verification</u>	Samples were collected on each day of application and were analyzed with using HPLC equipped with a Waters 486 variable wavelength detector.	
LOQ: LOD:	0.044 µg a.i./mL 0.040 µg a.i./mL	
Adjuvant (type, percentage, if used)	Two components were used to prepare the adjuvant. First was ammonium sulfate (purity of 99.6%) and the second was Scoil Spray Adjuvant, containing methylated seed soil. The adjuvant spray mixture was prepared by diluting 40 g of ammonium sulfate and 20 mL of Scoil spray adjuvant to 2000 mL with osmosis-purified water. On August 22, August 24 and October 23, 2007, spray mixtures for the highest application rate used on each day were prepared, respectively, by diluting 3.3358 g of the test substance to a volume of 200 mL (400 g ai/ha), 1.042 g of the test substance to 250	

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
	mL, and 0.1350 g of the test substance to 250 mL with the adjuvant mixture. Spray mixtures for subsequent test concentrations down to the 0.39 g ai/ha application rate were made as required by proportional dilution with the adjuvant control. On August 22, 2007, the spray mixture for the 0.78 g ai/ha rate was prepared by diluting 0.20 mL of the 400 g ai/ha spray mixture to a volume of 100 mL. Spray mixtures for the remaining application rates were made by proportional dilution.	
<u>Test container (pot)</u> Size/Volume Material: (glass/polystyrene)	11 cm diameter by 10 cm deep Plastic	<i>Non-porous containers should be used.</i> <i>OECD recommends that non-porous plastic or glazed pots be used.</i>
Growth facility	On-site greenhouses	
Method/depth of seeding	Corn, wheat, bean and soybean seeds were planted to a depth of 20 mm; all other species were planted to a depth of 6 mm.	
<u>Test material application</u> Application time including the plant growth stage	Test material was applied on Day 0 to seedlings ranging in age from the 1 to 4 leaf stage.	
Number of application	1	
Application interval	N/A; single application	
Method of application	DeVries Research Track Sprayer	

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Parameters	Vegetative Vigor	
	Details	Remarks <i>Criteria</i>
<u>Details of soil used</u> Geographic location Depth of soil collection Soil texture % sand % silt % clay pH: % organic carbon CEC Moisture at 1/3 atm (%)	Not Reported Not Reported Sandy Loam 75% 11% 14% 7.2 1.3% (organic matter content) Not Reported Not Reported	<i>EPA prefers soil mixes containing sandy loam, loam, or clay loam soil with no greater than 2% organic matter. Glass beads, rock wool, and 100% acid washed sand are not preferred.</i> <i>OECD prefers the soil to be sieved (0.5 cm) to remove coarse fragments. Carbon content should not exceed 1.5% (3% organic matter). Fine particles (under 20um) makeup should be between 10 and 20%. The recommended pH is between 5.0 and 7.5.</i>
Details of nutrient medium, if used	N/A; a nutrient medium was not used	
<u>Watering regime and schedules</u> Water source/type: Volume applied: Interval of application: Method of application:	Well water As needed As needed Sub-irrigation	<i>EPA prefers that under foliage watering or bottom watering be utilized for vegetative vigor studies so that the chemical is not washed out of the soil during the test.</i>
Any pest control method/fertilization, if used	A slow-release fertilizer was added to provide nutrients essential for plant growth.	
<u>Test conditions</u> Temperature:	<u>Onion, Ryegrass, Wheat, Soybean and Tomato:</u> 20.14-42.74°C	Artificial lighting was used to supplement natural sunlight in order to provide a minimum 16-hour photoperiod.

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Parameters	Vegetative Vigor	
	Details	Remarks
		<i>Criteria</i>
Photoperiod: Light intensity and quality: Relative humidity:	16L:8D 11.7-15.1 moles PAR 23.93-93.00%	<i>EPA prefers that the cold vs warm loving plants be tested in two separate groups to optimize plant growth.</i>
Temperature: Photoperiod: Light intensity and quality: Relative humidity:	<u>Corn, Oilseed Rape and Cabbage:</u> 19.88-42.74°C 16L:8D 11.7-15.1 moles PAR 23.93-93.00%	<i>OECD prefers that the temperature, humidity and light conditions be suitable for maintaining normal growth of each species for the test period.</i>
Temperature: Photoperiod: Light intensity and quality: Relative humidity:	<u>Bean and Lettuce:</u> 15.85-32.94°C 16L:8D 11.3-16.6 moles PAR 17.03-95.80%	
<u>Reference chemical (if used)</u> Name: Concentrations:	N/A N/A	A reference chemical was not used.
Other parameters, if any	None	

2. Observations:

Table 4: Observation Parameters - Vegetative Vigor

Parameters	Vegetative Vigor	
	Details	Remarks
Parameters measured (i.e., plant height, dry weight or other endpoints)	-Survival -Dry Weight -Plant Height -Phytotoxicity	
Measurement technique for each parameter	Survival and phytotoxicity were assessed by direct observation. Individual plant heights were measured to the nearest whole centimeter from the surface of the soil to the tip of the longest leaf (ryegrass, onion, wheat, corn, oilseed rape, cabbage and lettuce) or	

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	to the tip of the apical meristem (soybean, bean and tomato). Living plants were clipped at soil level and each replicate was dried and weighed. The total shoot dry weight for each replicate was divided by the number of plants weighed to determine the mean dry weight per plant for each treatment group.	
Observation intervals	Phytotoxicity and plant height were assessed weekly. Survival and dry weight were assessed at test termination.	Observations of height and plant condition for one bean plant (nominal treatment level 0.012 lbs a.i./A [13 g a.i./ha], replicate D, plant 4) were inadvertently not made on day 14 (Appendix 2, pg. 39).
Other observations, if any	None	
Were raw data included?	Yes	
Phytotoxicity rating system, if used	0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40- moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly destroyed w/ few surviving leaves, 90- occasional surviving leaves); 100, complete effect	Rating scale adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

II. RESULTS and DISCUSSION:

A. INHIBITORY EFFECTS:

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

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Vegetative Vigor:

Wheat survival was the only endpoint not exhibiting sensitivity to the test material. Inhibitions in dry weight were >50% for all species relative to the negative control. Inhibitions in plant height were >25% for all species except lettuce and oilseed rape; however, the two highest lettuce treatment levels exhibited complete mortality. Soybean, wheat and corn were the only species that did not exhibit inhibitions of >25% for survival. Onion was the most sensitive monocot, based on dry weight, with NOAEC, EC₂₅ and EC₅₀ values of 0.0020, 0.003 and 0.0047 lbs a.i./A, respectively (equivalent to 2.2, 3.40, and 5.29 g a.i./ha, respectively). Tomato was the most sensitive dicot, based on dry weight, with NOAEC, EC₂₅ and EC₅₀ values of 0.000066, 0.0001 and 0.0002 lbs a.i./A, respectively (equivalent to 0.073, 0.1508, and 0.2615 g a.i./ha, respectively).

Treatment-related phytotoxic effects were observed for all species, except wheat, which only exhibited sporadic phytotoxic effects. Observed effects included necrosis, leaf curl, stem curl, chlorosis and wilt. All surviving cabbage seedlings in the treatment groups exhibited phytotoxic effects. Soybean was observed with insect damage.

B. REPORTED STATISTICS:

Statistical analyses were used to evaluate the effects of test substance application on height, shoot dry weight and survival when warranted. Analyses were performed on data from the test using the DUNNETT option of the GLM (general linear model) procedure of SAS version 8. Significance was determined at the level of 0.05. Statistical analyses were not conducted for plant condition because those data are qualitative and subjective and therefore not conducive to analysis with Dunnett's test.

The NOAEC values were estimated using Dunnett's test by determining which treatment groups differed from the control group (possibly pooled controls). Statistical analyses for species also included the determination of effect rates (ER estimates) and their confidence limits using the non-linear regression analysis of Bruce and Versteeg when reductions in test endpoints among one or more treatment groups were 25% or more relative to control means. Analyses were conducted using the NLIN procedure of SAS.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

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Table 5: Reported effect of BAS 800 02 H on Vegetative Vigor

Species	Results summary for dry weight (lbs a.i./A; based on nominal concentrations unless otherwise noted; reported by the study author)								
	g*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	r ²
Corn	1.31-4.43	0.0028	N.R.	N.R.	0.0050	0.0010-0.026	0.020	0.0072-0.054	0.92630
Onion ¹	0.025-0.094	0.074	N.R.	N.R.	0.0048	0.00035-0.068	0.020	0.0042-0.091	0.90231
Ryegrass	0.147-0.613	<0.026 ²	<0.026	N/A	<0.026	N/A	0.079	0.0098-0.64	0.90481
Wheat	0.442-1.343	0.0011	N.R.	N.R.	0.014	0.0057-0.035	0.046	0.028-0.075	0.98485
Bean	0.72-4.97	0.00070	N.R.	N.R.	0.00078	0.00040-0.0010	0.0022	0.0015-0.0034	0.97447
Cabbage	0.66-2.99	<0.0014 ²	<0.0014	N/A	<0.0014	N/A	0.0049	0.0014-0.017	0.94414
Lettuce	0.89-2.24	0.00018	N.R.	N.R.	0.00027	0.00011-0.00067	0.00055	0.00035-0.00086	0.97538
Oilseed Rape	2.07-5.47	0.0028	N.R.	N.R.	0.0050	0.0021-0.012	0.023	0.014-0.037	0.97653
Soybean ¹	0.81-5.15	0.00028	N.R.	N.R.	0.00033	0.000043-0.0025	0.0012	0.00032-0.0043	0.91190
Tomato ¹	0.11-4.66	0.000066	N.R.	N.R.	0.00012	0.000069-0.00020	0.00021	0.00014-0.00030	0.99068

* range provided represents the range of the treatment means including controls

¹ Toxicity values were determined using the measured application rates

² Calculated EC₀₅ estimate

N/A- Not Applicable

N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Table 5a: Reported effect of BAS 800 02 H on Vegetative Vigor

Species	Results summary for plant height (lbs a.i./A; based on nominal concentrations unless otherwise noted; reported by the study author)								
	cm*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	r ²
Corn	62.0-87.9	0.0056	N.R.	N.R.	0.056	0.028-0.11	>0.089	N/A	0.95481
Onion ¹	13.8-25.0	0.0020	N.R.	N.R.	0.0073	0.00074-0.073	>0.074	N/A	0.93962
Ryegrass	15.2-22.9	0.045	N.R.	N.R.	0.18	0.012-2.5	>0.36	N/A	0.77779
Wheat	43.9-62.0	0.0098	N.R.	N.R.	0.067	0.049-0.090	>0.089	N/A	0.98783
Bean	17.0-70.2	0.00018	N.R.	N.R.	0.00022	0.0000031-0.015	0.0016	0.00013-0.019	0.86487
Cabbage	13.2-21.0	0.0056	N.R.	N.R.	>0.044	N/A	>0.044	N/A	N.R.
Lettuce	12.7-14.6	0.00070	N.R.	N.R.	>0.0070	N/A	>0.0070	N/A	N.R.
Oilseed Rape	28.1-35.9	0.022	N.R.	N.R.	>0.044	N/A	>0.044	N/A	N.R.
Soybean ¹	22.4-64.1	0.00028	N.R.	N.R.	0.00055	0.00014-0.0022	0.0034	0.0016-0.0073	0.96137
Tomato ¹	6.0-51.0	0.000066	N.R.	N.R.	0.00022	0.00018-0.00028	0.00039	0.00034-0.00045	0.99978

* range provided represents the range of the treatment means

¹ Toxicity values were determined using the measured application rates including controls

N/A- Not Applicable

N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Table 5b: Reported effect of BAS 800 02 H on Vegetative Vigor

Species	Results summary for survival (lbs a.i./A; based on nominal concentrations unless otherwise noted; reported by the study author)								
	%*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	r ²
Corn	83.3-100	0.045	N.R.	N.R.	>0.089	N/A	>0.089	N/A	N.R.
Onion ¹	10-100	0.0020	N.R.	N.R.	0.0043	0.0017-0.011	0.011	0.0057-0.020	0.97661
Ryegrass	10-100	0.089	N.R.	N.R.	0.099	0.082-0.12	0.15	0.14-0.18	0.99495
Wheat	96.7-100	0.089	N.R.	N.R.	>0.089	N/A	>0.089	N/A	N.R.
Bean	6.7-100	0.00070	N.R.	N.R.	0.00083	0.00026-0.0026	0.0017	0.00078-0.0037	0.93255
Cabbage	33.3-100	0.0056	N.R.	N.R.	0.0061	0.0020-0.019	0.018	0.0091-0.034	0.94336
Lettuce	0-100	0.00018	N.R.	N.R.	0.000609	0.000605-0.000613	0.00069	0.00069-0.00069	1.00000
Oilseed Rape	43.3-100	0.011	N.R.	N.R.	0.020	0.017-0.023	0.037	0.034-0.041	0.99260
Soybean ¹	83.3-100	0.0031	N.R.	N.R.	>0.013	N/A	>0.013	N/A	N.R.
Tomato ¹	0-100	0.00028	N.R.	N.R.	0.00075	0.00073-0.00076	0.00082	0.00081-0.00083	0.99883

* range provided represents the range of the treatment means

¹ Toxicity values were determined using the measured application rates including controls

N/A- Not Applicable

N.R.- Not Reported

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

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Plant Injury Index (reported by the study author)											
Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbage	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
0-40	0-60	2-100	0-100	0-22	0-100	10-88	0-100	10-100	0-84	0-100	0-40

Plant injury values represent the range of replicate means with the controls and treatment levels respectively. Plant Injury was assessed using the following rating scale: 0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40-moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect. This scale was adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

C. VERIFICATION OF STATISTICAL RESULTS BY THE REVIEWER:

Statistical Method(s): Any species exhibiting an inhibition of $\geq 5\%$ relative to the negative control based on % survival, dry weight or plant height was statistically analyzed. The toxicity values were visually determined when inhibitions did not exceed 5% for a given endpoint. Prior to determining the toxicity values, the replicate data from the negative and adjuvant controls were compared using a Student's t test to determine if a significant difference existed. Regardless of the results, all subsequent analyses were conducted using the negative control only. The reviewer tested each data set for normality using the Chi-square and Shapiro-Wilks tests and for homogeneity of variance using the Hartley and Bartlett's tests. If the data met these assumptions of ANOVA, the NOAEC values for plant height and survival were determined using the parametric Dunnett's test (or Bonferroni's test for unequal replicates) and Williams' test. If the data did not meet these assumptions, the NOAEC value was determined using the non-parametric Kruskal-Wallis test. In all cases, the reviewer also compared the dose-response pattern (as determined by the % inhibitions) to the output of the statistical tests to determine if biological significance existed in the absence of statistical significance. These analyses were conducted using Toxstat statistical software for plant height and survival endpoints. The reviewer then attempted to determine the EC_x values, 95% confidence intervals and slopes using the probit analysis via Nuthatch statistical software for plant height and survival endpoints. Treatment levels were only included in the analyses for dry weight and plant height if two or more replicates contained surviving seedlings; those treatment levels with only one viable replicate were excluded. All analyses were conducted using the measured application rates. Total dry weight was calculated by multiplying the reported average dry weight per living plant by the number of survivors in that pot. Hypothesis testing for the dry weight endpoint was conducted with Dunnett's test except in cases where the assumptions of normality and equal variances were not met. In these cases, Bonferroni's t-test was used. Point estimates were derived using linear interpolation. All dry weight statistical analysis and endpoints were derived using TOXCALC (v5.0.32; Tidepool Scientific Software, McKinleyville, CA).

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Table 6: Reported effect of BAS 800 02 H on Vegetative Vigor

Species	Results summary for dry weight (lbs a.i./A and g a.i./ha; based on mean-measured concentrations; reported by the reviewer)*									
	g**	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀	95%CI	Slope	Std Err
Corn	5.458-21.642	0.0027 (3.0)	0.0032 (3.56)	<0.000-0.0044 (<0.000-4.93)	0.0053 (5.89)	0.003-0.0125 (3.37-14.0)	0.017 (19.0)	0.012-0.0258 (13.4-28.9)	N.D.	N.D.
Onion	0.040-0.3983	0.0020 (2.2)	0.0004 (0.4082)	1.2x10 ⁻⁵ -0.0029 (0.0138-3.27)	0.003 (3.40)	<0.000-0.0041 (<0.000-4.54)	0.0047 (5.29)	0.0031-0.009 (3.49-10.1)	N.D.	N.D.
Ryegrass	0.2817-2.1483	0.026 (29)	0.0051 (5.77)	0.0019-0.0357 (2.12-0.0019)	0.0257 (28.8)	0.0095-0.0506 (10.6-56.7)	0.0478 (53.5)	0.0242-0.0939 (27.1-105)	N.D.	N.D.
Wheat	1.98-7.07	0.00023 (0.3)	0.0011 (1.28)	<0.000-0.0034 (<0.000-3.78)	0.0071 (7.97)	0.0007-0.0131 (0.767-14.7)	0.0415 (46.5)	0.0275-0.0520 (30.8-58.2)	N.D.	N.D.
Bean	0.720-24.867	0.00012 (0.13)	0.0002 (0.2286)	<0.000-0.0002 (<0.000-0.2636)	0.0006 (0.6319)	0.0004-0.0007 (0.4327-0.8057)	0.0012 (1.31)	0.0010-0.0013 (1.12-1.46)	N.D.	N.D.
Cabbage	0.938-11.475	<0.0013 (<1.5)	0.0003 (0.3221)	0.0002-0.0005 (0.208-0.6058)	0.0015 (1.66)	0.0009-0.0022 (1.02-2.48)	0.0043 (4.81)	0.0027-0.0069 (2.98-7.69)	N.D.	N.D.
Lettuce	2.352-10.842	0.00012 (0.13)	0.000066 (0.0741)	0.00005-0.0001 (0.0592-0.1201)	0.0002 (0.2144)	0.0001-0.0002 (0.1591-0.2716)	0.0004 (0.3969)	0.0003-0.0004 (0.3404-0.4509)	N.D.	N.D.
Oilseed Rape	8.48-24.3	0.0027 (3.0)	0.0012 (1.34)	0.0003-0.0009 (0.335-1.04)	0.005 (5.63)	0.0032-0.0069 (3.54-7.68)	0.013 (14.5)	0.0083-0.0244 (9.33-27.3)	N.D.	N.D.
Soybean	3.40-25.567	0.00028 (0.32)	0.00036 (0.4026)	4.9x10 ⁻⁵ -0.0004 (0.0551-0.4213)	0.0007 (0.734)	0.0004-0.0008 (0.4848-0.8504)	0.001 (1.15)	0.0009-0.0018 (0.9532-1.97)	N.D.	N.D.
Tomato ¹	0.110-20.883	0.000066 (0.073)	3.6x10 ⁻⁵ (0.0404)	<0.000-0.0001 (<0.000-0.1098)	0.0001 (0.1508)	0.0001-0.0002 (0.0783-0.1932)	0.0002 (0.2615)	0.0002-0.0003 (0.215-0.3159)	N.D.	N.D.

* lbs a.i./A are presented first, followed by g a.i./ha in parentheses.

** range provided represents the range of the treatment means including the controls

¹ Toxicity values were based on the highest treatment level with surviving seedlings

N/A- Not Applicable

N.D.- Not Determined

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Table 6a: Reported effect of BAS 800 02 H on Vegetative Vigor

Species	Results summary for plant height (lbs a.i./A; based on mean-measured concentrations; reported by the reviewer)									
	cm*	NOAEC	EC ₀₅	95%CI	EC ₂₅ **	95%CI**	EC ₅₀ **	95%CI**	Slope	Std Err
Corn	62.0-87.9	0.0052	0.0033	0.00071-0.016	0.050	0.029-0.086	>0.075 (0.33)	N/A (0.14-0.77)	0.822	0.189
Onion	13.8-25.0	0.0020	0.00013	1.5x10 ⁻⁶ -0.012	0.0056	0.00072-0.043	>0.074 (0.075)	N/A (0.013-0.43)	0.597	0.225
Ryegrass	15.2-22.9	0.041	0.011	0.0009-0.12	0.13	0.049-0.33	>0.31 (0.71)	N/A (0.19-2.7)	0.899	0.342
Wheat	43.9-62.0	0.0029	0.0034	0.0016-0.0074	0.049	0.039-0.063	0.32	0.21-0.48	0.838	0.0991
Bean	17.0-70.2	0.00012	0.000017	2.1x10 ⁻⁶ -0.00014	0.00018	5.4x10 ⁻⁵ -0.00063	0.00096	0.00047-0.0020	0.940	0.188
Cabbage	13.2-21.0	0.0052	0.0014	4.7x10 ⁻⁵ -0.040	0.024	0.0074-0.079	>0.038 (0.18)	N/A (0.029-1.1)	0.777	0.365
Lettuce ¹	12.7-14.6	0.00053	>0.00053	N/A	>0.00053	N/A	>0.00053	N/A	N/A	N/A
Oilseed Rape	28.1-35.9	0.020	0.0077	0.0011-0.055	>0.038 (0.052)	N/A (0.022-0.12)	>0.038 (0.19)	N/A (0.023-1.6)	1.17	0.685
Soybean	22.4-64.1	0.00028	0.000042	0.000011-0.00017	0.00058	0.00028-0.0012	0.0036	0.0024-0.0055	0.853	0.109
Tomato ¹	6.0-51.0	0.000066	0.000057	0.000021-0.00016	0.00020	0.00014-0.00028	>0.00028 (0.00047)	N/A (0.00032-0.00069)	1.80	0.528

* range provided represents the range of the treatment means including the controls

** Point estimates are also provided in parentheses for EC₂₅ and EC₅₀ values that exceed the highest test concentration, if appropriate (see Reviewer's comments).

¹ Toxicity values were based on the highest treatment level with surviving seedlings

N/A- Not Applicable

N.D.- Not Determined

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Table 6b: Reported effect of BAS 800 02 H on Vegetative Vigor

Species	Results summary for survival (lbs a.i./A; based on mean-measured concentrations; reported by the reviewer)									
	%*	NOAEC	EC ₀₅	95%CI	EC ₂₅	95%CI	EC ₅₀ **	95%CI**	Slope	Std Err
Corn	83.3-100	0.039	0.048	0.028-0.082	>0.075 (0.093)	N/A (0.069-0.13)	>0.075 (0.15)	N/A (0.066-0.33)	3.39	1.94
Onion	10-100	0.0020	0.0011	0.00022-0.0057	0.0042	0.0015-0.012	0.011	0.0052-0.022	1.68	0.371
Ryegrass	10-100	0.074	0.048	0.022-0.10	0.090	0.056-0.15	0.14	0.10-0.19	3.59	0.855
Wheat	96.7-100	0.074	>0.074	N/A	>0.074	N/A	>0.074	N/A	N/A	N/A
Bean	6.7-100	0.00053	0.00023	0.00010-0.00050	0.00065	0.00039-0.0011	0.0014	0.00096-0.0019	2.12	0.297
Cabbage	33.3-100	0.0013	0.0013	0.00043-0.0038	0.0056	0.0030-0.010	0.016	0.011-0.022	1.51	0.252
Lettuce	0-100	0.00012	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Oilseed Rape	43.3-100	0.0096	0.0076	0.0029-0.020	0.018	0.011-0.028	0.033	0.025-0.042	2.60	0.813
Soybean	83.3-100	0.0031	N.D.	N.D.	>0.013	N/A	>0.013	N/A	N.D.	N.D.
Tomato	0-100	0.00028	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

* range provided represents the range of the treatment means including the controls

** Point estimates are also provided in parentheses for EC₂₅ and EC₅₀ values that exceed the highest test concentration, if appropriate (see Reviewer's comments).

N/A- Not Applicable

N.D.- Not Determined

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

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Plant Injury Index (reported by the reviewer)											
Control	Corn	Onion	Ryegrass	Wheat	Bean	Cabbag e	Lettuce	Oilseed Rape	Soybean	Tomato	Adj control
0-40	0-60	2-100	0-100	0-22	0-100	10-88	0-100	10-100	0-84	0-100	0-40

Plant injury values represent the range of replicate means with the controls and treatment levels respectively. Plant Injury was assessed using the following rating scale: 0, no effect; 10-30 slight effect (10- barely noticeable, 20- not apparently detrimental, 30- effect more pronounced); 40-60, moderate effect (40-moderate, recovery possible, 50-more lasting effect and recovery doubtful, 60- lasting effect and recovery doubtful); 70-90 severe effect (70- heavy injury w/ loss of leaves, 80- plant nearly destroyed w/ few surviving leaves, 90-occasional surviving leaves); 100, complete effect. This scale was adapted from: Frans, Robert E and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science Society, Auburn University, Alabama.

Monocot

EC₀₅/IC₀₅: 0.0004 lbs a.i./A (0.408 g a.i./ha)

95% C.I.: 1.2x10⁻⁵-0.0029 lbs a.i./A (0.0138-3.27 g a.i./ha)

EC₂₅/IC₂₅: 0.003 lbs a.i./A (3.40 g a.i./ha)

95% C.I.: <0.0000-0.0041 lbs a.i./A (<0.0000-4.54 g a.i./ha)

EC₅₀/IC₅₀: 0.0047 lbs a.i./A (5.29 g a.i./ha)

95% C.I.: 0.0031-0.009 lbs a.i./A (3.49-10.1 g a.i./ha)

NOAEC: 0.0020 lbs a.i./A (2.2 g a.i./ha)

Slope: N.D.

Std err: N.D.

Most sensitive monocot: Onion

Most sensitive parameter: Dry Weight

Dicot

EC₀₅/IC₀₅: 0.000036 lbs a.i./A (0.0404 g a.i./ha)

95% C.I.: <0.0000-0.001 lbs a.i./A (<0.0000-0.1098 g a.i./ha)

EC₂₅/IC₂₅: 0.0001 lbs a.i./A (0.1508 g a.i./ha)

95% C.I.: 0.0001-0.0002 lbs a.i./A (0.0783-0.1932 g a.i./ha)

EC₅₀/IC₅₀: 0.0002 lbs a.i./A (0.2615 g a.i./ha)

95% C.I.: 0.0002-0.0003 lbs a.i./A (0.215-0.3159 g a.i./ha)

NOAEC: 0.000066 lbs a.i./A (0.073 g a.i./ha)

Slope: N.D.

Std err: N.D.

Most sensitive dicot: Tomato

Most sensitive parameter: Dry Weight

D. STUDY DEFICIENCIES:

There were no study deficiencies.

E. REVIEWER'S COMMENTS:

The reviewer's results were determined by comparing treatment data to the negative control only and using the measured application rates. The study authors determined the toxicity values by comparing treatment data to the pooled controls. Furthermore, the nominal application rates were used for all species with the exception of onion, soybean and tomato. The study authors derived all dry weight endpoints on a "per plant" rather than "per pot" basis; therefore, the reviewer recalculated all dry weight endpoints by multiplying the reported average dry weight per living plant by the number of survivors in that pot. Aside from these differences, the reviewer

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similarly identified sensitivity of the same monocot and dicot species as the study authors. The reviewer's results are reported in the Executive Summary and Conclusions sections of this DER. In addition, given that PMRA derives a species sensitivity distribution of the EC₅₀ values to estimate the regulatory endpoint, point estimates are also provided for EC₅₀ (and EC₂₅) values that are greater than the highest test concentration when it is possible to derive a point estimate along with 95% confidence limits. If point estimates cannot be derived, the EC₅₀ (and EC₂₅) value is reported as a "greater than" the highest test concentration.

Lettuce survival was 100% in the controls and in the 0.000012-0.00012 lbs a.i./A treatment groups, 50% in the 0.00053 lbs a.i./A treatment group and 0% in the 0.0022 and 0.0092 lbs a.i./A treatment groups. Probit analysis was not a suitable model for this set of data and, therefore, the reviewer was unable to determine the toxicity values for lettuce survival. As a result, the reviewer determined the most sensitive endpoint for lettuce based on the toxicity values from dry weight and plant height. Similarly, the reviewer was unable to determine EC_x values for tomato survival and, therefore, determined the most sensitive endpoint for tomato based on the toxicity values from dry weight and plant height.

Samples from the adjuvant control on two of the three sampling days indicated the presence of a co-eluting substance at the characteristic retention time of the test substance. The measured values for affected samples in the two time intervals were corrected for the contribution from the co-eluting adjuvant peak. No test material was detected in negative control samples. Recoveries from the samples collected on 08/22/07 ranged from 21 to 196% of nominal. Recoveries from the samples collected on 08/24/07 and 10/23/07 ranged from 76 to 110% of nominal.

The reviewer's analyses indicated that no significant differences existed between the negative and adjuvant controls for any endpoint analyzed.

The in-life portion of the vegetative vigor test with onion, ryegrass, wheat, soybean and tomato was conducted from August 22 to September 12, 2007, with corn, oilseed rape and cabbage from August 24 to September 14, 2007, and with lettuce and bean from October 23 to November 13, 2007.

F. CONCLUSIONS:

This toxicity study is classified as ACCEPTABLE to U.S. EPA and FULLY RELIABLE to PMRA and APVMA. Onion was the most sensitive monocot, based on dry weight, with NOAEC, EC₂₅ and EC₅₀ values of 0.0020, 0.003 and 0.0047 lbs a.i./A, respectively (equivalent to 2.2, 3.40, and 5.29 g a.i./ha, respectively). Tomato was the most sensitive dicot, based on dry weight, with NOAEC, EC₂₅ and EC₅₀ values of 0.000066, 0.0001 and 0.0002 lbs a.i./A, respectively (equivalent to 0.073, 0.1508, and 0.2615 g a.i./ha, respectively).

Most sensitive monocot and EC₂₅: Onion (Dry Weight), 0.003 lbs a.i./A (3.40 g a.i./ha)

Most sensitive dicot and EC₂₅: Tomato (Dry Weight), 0.0001 lbs a.i./A (0.1508 g a.i./ha)

III. REFERENCES:

U.S. Environmental Protection Agency. 1996. Series 850- Ecological Effects Test Guidelines (*draft*), OPPTS Number 850.4150: Terrestrial Plant Toxicity, Tier I (Vegetative Vigor).

U.S. Environmental Protection Agency. 1996. Series 850- Ecological Effects Test Guidelines (*draft*), OPPTS Number 850.4250: Terrestrial Plant Toxicity, Tier II (Vegetative Vigor).

Frans, Robert E. and Ronald E. Talbert. 1977. Design of Field Experiments and the Measurement and Analysis of Plant Responses. Pages 15-23 in B. Truelove, ed. Research Methods in Weed Science. Southern Weed Science

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SAS Institute, Inc. 1999. SAS Proprietary Software Version 8, Cary, NC, SAS Institute, Inc.

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Environmental Toxicology and Chemistry, 11: 1485-1494.

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APPENDIX I. OUTPUT OF REVIEWER'S STATISTICAL VERIFICATION:

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 87.0333 CALCULATED t VALUE = -0.3321
GRP2 (BLANK CRTL) MEAN = 87.9000 DEGREES OF FREEDOM = 10
DIFERENCE IN MEANS = -0.8667

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	0	16	15	7	4

Calculated Chi-Square goodness of fit test statistic = 7.7177
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 1504.235

W = 0.979

Critical W (P = 0.05) (n = 42) = 0.942
Critical W (P = 0.01) (n = 42) = 0.922

Data PASS normality test at P=0.01 level. Continue analysis.

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 5.62
Closest, conservative, Table H statistic = 42.0 (alpha = 0.01)

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Used for Table H ==> R (# groups) = 7, df (# reps-1) = 5
Actual values ==> R (# groups) = 7, df (# avg reps-1) = 5.00

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 6.61
Table Chi-square value = 16.81 (alpha = 0.01)
Table Chi-square value = 12.59 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 5.00
Used for Chi-square table value ==> df (#groups-1) = 6

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	3256.113	542.685	12.627
Within (Error)	35	1504.235	42.978	
Total	41	4760.348		

Critical F value = 2.42 (0.05, 6, 30)
Since F > Critical F REJECT Ho:All groups equal

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED	MEAN CALCULATED IN	T STAT	SIG
		MEAN	ORIGINAL UNITS		
1	neg control	87.033	87.033		
2	0.0027	87.833	87.833	-0.211	

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3	0.0052	82.300	82.300	1.251
4	0.010	77.700	77.700	2.466 *
5	0.020	71.533	71.533	4.095 *
6	0.039	70.700	70.700	4.315 *
7	0.075	61.950	61.950	6.627 *

Dunnett table value = 2.40 (1 Tailed Value, P=0.05, df=30, 6)

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

DUNNETTS TEST

TABLE 2 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	6			
2	0.0027	6	9.084	10.4	-0.800
3	0.0052	6	9.084	10.4	4.733
4	0.010	6	9.084	10.4	9.333
5	0.020	6	9.084	10.4	15.500
6	0.039	6	9.084	10.4	16.333
7	0.075	6	9.084	10.4	25.083

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	87.033	87.033	87.433
2	0.0027	6	87.833	87.833	87.433
3	0.0052	6	82.300	82.300	82.300
4	0.010	6	77.700	77.700	77.700
5	0.020	6	71.533	71.533	71.533
6	0.039	6	70.700	70.700	70.700
7	0.075	6	61.950	61.950	61.950

Corn plant height (cm), Day 21; lbs a.i./A
File: 7920ch Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	87.433				
0.0027	87.433	0.106		1.69	k= 1, v=35
0.0052	82.300	1.251		1.77	k= 2, v=35
0.010	77.700	2.466 *		1.79	k= 3, v=35
0.020	71.533	4.095 *		1.80	k= 4, v=35
0.039	70.700	4.315 *		1.81	k= 5, v=35

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0.075	61.950	6.627	*	1.82	k = 6, v=35
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s = 6.556

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0033	0.00071	0.016	0.33	0.21
EC10	0.0092	0.0030	0.028	0.24	0.33
EC25	0.050	0.029	0.086	0.11	0.59
EC50	0.33	0.14	0.77	0.18	0.43

Slope = 0.822. Std.Err. = 0.189

Goodness of fit: p = 0.50 based on DF= 4.0 35.

7920CH : Corn plant height (cm), Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means.

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	87.0	88.3	-1.27	100.	0.00
0.00270	6.00	87.8	84.5	3.32	95.7	4.29
0.00520	6.00	82.3	82.2	0.0875	93.1	6.89
0.0100	6.00	77.7	79.0	-1.28	89.4	10.6
0.0200	6.00	71.5	74.4	-2.82	84.2	15.8
0.0390	6.00	70.7	68.7	2.02	77.8	22.2
0.0750	6.00	62.0	62.0	-0.0712	70.2	29.8

!!!Warning: EC50 not bracketed by doses evaluated.

Corn % survival, Day 21; lbs a.i./A

File: 7920cs Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	3	0	37	2	0

Calculated Chi-Square goodness of fit test statistic = 46.9197

Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Corn % survival, Day 21; lbs a.i./A

File: 7920cs Transform: NO TRANSFORMATION

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Shapiro Wilks test for normality

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D = 1800.000

W = 0.702

Critical W (P = 0.05) (n = 42) = 0.942

Critical W (P = 0.01) (n = 42) = 0.922

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Corn % survival, Day 21; lbs a.i./A

File: 7920cs Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.

Additional transformations are useless.

Corn % survival, Day 21; lbs a.i./A

File: 7920cs Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	147.000
2	0.0027	100.000	100.000	147.000
3	0.0052	96.667	96.667	126.500
4	0.010	100.000	100.000	147.000
5	0.020	100.000	100.000	147.000
6	0.039	96.667	96.667	126.500
7	0.075	83.333	83.333	62.000

Calculated H Value = 2.001 Critical H Value Table = 12.590

Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Corn % survival, Day 21; lbs a.i./A

File: 7920cs Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

TRANSFORMED	ORIGINAL	GROUP
		0 0 0 0 0 0 0

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GROUP	IDENTIFICATION	MEAN	MEAN	7	6	3	4	5	2	1
7		0.075	83.333	83.333	\					
6		0.039	96.667	96.667	.	\				
3		0.0052	96.667	96.667	.	.	\			
4		0.010	100.000	100.000	.	.	.	\		
5		0.020	100.000	100.000	.	.	.	.	\
2		0.0027	100.000	100.000	.	.	.	.	\
1	neg control	100.000	100.000	100.000	.	.	.	.	.	\

* = significant difference ($p=0.05$) . = no significant difference
Table q value (0.05, 7) = 3.038 SE = 7.931

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.048	0.028	0.082	0.11	0.59
EC10	0.062	0.047	0.081	0.060	0.76
EC25	0.093	0.069	0.13	0.065	0.74
EC50	0.15	0.066	0.33	0.17	0.45

Slope = 3.39 Std.Err. = 1.94

Goodness of fit: p = 0.92 based on DF= 4.0 35.

7920CS : Corn % survival, Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	100.	99.3	0.660	100.	0.00
0.00270	6.00	100.	99.3	0.660	100.	1.93e-07
0.00520	6.00	96.7	99.3	-2.67	100.	4.25e-05
0.0100	6.00	100.	99.3	0.664	100.	0.00375
0.0200	6.00	100.	99.2	0.824	99.8	0.165
0.0390	6.00	96.7	96.8	-0.150	97.5	2.54
0.0750	6.00	83.3	83.3	0.0159	83.9	16.1

!!!Warning: EC25 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Onion plant height (cm), Day 21; lbs a.i./A

File: 7920nh Transform: NO TRANSFORM

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 24.9667	CALCULATED t VALUE = 0.9564
GRP2 (BLANK CRTL) MEAN = 23.0833	DEGREES OF FREEDOM = 10
DIFFERENCE IN MEANS = 1.8833	

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Onion plant height (cm), Day 21; lbs a.i./A

File: 7920nh Transform: NO TRANSFORMATION

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Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.943	7.018	11.078	7.018	1.943
OBSERVED	0	9	12	6	2

Calculated Chi-Square goodness of fit test statistic = 2.7288
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 503.925

W = 0.972

Critical W (P = 0.05) (n = 29) = 0.926
Critical W (P = 0.01) (n = 29) = 0.898

Data PASS normality test at P=0.01 level. Continue analysis.

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 7.15
Closest, conservative, Table H statistic = 69.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 6, df (# reps-1) = 4
Actual values ==> R (# groups) = 6, df (# avg reps-1) = 3.83
(average df used)

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

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Calculated B statistic = 6.88
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 3.83
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	397.805	79.561	3.631
Within (Error)	23	503.925	21.910	
Total	28	901.730		

Critical F value = 2.64 (0.05,5,23)
Since F > Critical F REJECT Ho:All groups equal

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	24.967	24.967		
2	0.00067	22.433	22.433	0.937	
3	0.0020	22.033	22.033	1.085	
4	0.0056	17.767	17.767	2.664 *	
5	0.026	14.567	14.567	3.142 *	
6	0.074	13.750	13.750	2.935 *	

Bonferroni T table value = 2.50 (1 Tailed Value, P=0.05, df=23,5)

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL

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1	neg control	6			
2	0.00067	6	6.756	27.1	2.533
3	0.0020	6	6.756	27.1	2.933
4	0.0056	6	6.756	27.1	7.200
5	0.026	3	8.275	33.1	10.400
6	0.074	2	9.555	38.3	11.217

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	24.967	24.967	24.967
2	0.00067	6	22.433	22.433	22.433
3	0.0020	6	22.033	22.033	22.033
4	0.0056	6	17.767	17.767	17.767
5	0.026	3	14.567	14.567	14.567
6	0.074	2	13.750	13.750	13.750

Onion plant height (cm), Day 21; lbs a.i./A
File: 7920nh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	24.967				
0.00067	22.433	0.937		1.72	k= 1, v=23
0.0020	22.033	1.085		1.80	k= 2, v=23
0.0056	17.767	2.664	*	1.83	k= 3, v=23
0.026	14.567	3.142	*	1.84	k= 4, v=23
0.074	13.750	2.935	*	1.85	k= 5, v=23

s = 4.681

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds	Std.Err.	Lower Bound /Estimate
		Lower	Upper	
EC5	0.00013	1.5E-06	0.012	0.95 0.011
EC10	0.00053	1.6E-05	0.017	0.74 0.031
EC25	0.0056	0.00072	0.043	0.43 0.13
EC50	0.075	0.013	0.43	0.37 0.17

Slope = 0.597 Std.Err. = 0.225

Goodness of fit: p = 0.81 based on DF= 3.0 23.

7920NH : Onion plant height (cm), Day 21; lbs a.i./A

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Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	25.0	25.2	-0.205	100.	0.00
0.000670	6.00	22.4	22.4	0.0485	88.9	11.1
0.00200	6.00	22.0	20.8	1.24	82.6	17.4
0.00560	6.00	17.8	18.9	-1.09	74.9	25.1
0.0260	3.00	14.6	15.3	-0.737	60.8	39.2
0.0740	2.00	13.8	12.6	1.14	50.1	49.9

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC10 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Onion % survival, Day 21; lbs a.i./A
File: 7920ns Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho: GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	100.0000	CALCULATED t VALUE =	1.0000
GRP2 (BLANK CRTL) MEAN =	96.6667	DEGREES OF FREEDOM =	10
DIFFERENCE IN MEANS =	3.3333		

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Onion % survival, Day 21; lbs a.i./A
File: 7920ns Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.412	8.712	13.752	8.712	2.412
OBSERVED	0	8	23	4	1

Calculated Chi-Square goodness of fit test statistic = 12.0645
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Onion % survival, Day 21; lbs a.i./A
File: 7920ns Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 7933.333

W = 0.851

Critical W (P = 0.05) (n = 36) = 0.935
Critical W (P = 0.01) (n = 36) = 0.912

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Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Onion % survival, Day 21; lbs a.i./A
File: 7920ns Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Onion % survival, Day 21; lbs a.i./A
File: 7920ns Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	162.000
2	0.00067	100.000	100.000	162.000
3	0.0020	100.000	100.000	162.000
4	0.0056	70.000	70.000	97.500
5	0.026	23.333	23.333	47.500
6	0.074	10.000	10.000	35.000

Calculated H Value = 19.311 Critical H Value Table = 11.070
Since Calc H > Crit H REJECT Ho:All groups are equal.

Onion % survival, Day 21; lbs a.i./A
File: 7920ns Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP					
				0	0	0	0	0	0
6	0.074	10.000	10.000	\					
5	0.026	23.333	23.333	.	\				
4	0.0056	70.000	70.000	.	.	\			
1	neg control	100.000	100.000	*	*	.	\		
2	0.00067	100.000	100.000	*	*	.	.	\	
3	0.0020	100.000	100.000	*	*	.	.	.	\

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* = significant difference ($p=0.05$) = no significant difference
Table q value (0.05, 6) = 2.936 SE = 5.590

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0011	0.00022	0.0057	0.35	0.20
EC10	0.0018	0.00045	0.0075	0.30	0.24
EC25	0.0042	0.0015	0.012	0.23	0.35
EC50	0.011	0.0052	0.022	0.15	0.49

Slope = 1.68 Std.Err. = 0.371

Goodness of fit: p = 0.84 based on DF= 3.0 30.

7920NS : Onion % survival, Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	100.	104.	-3.75	100.	0.00
0.000670	6.00	100.	101.	-1.49	97.8	2.18
0.00200	6.00	100.	92.2	7.75	88.9	11.1
0.00560	6.00	70.0	70.7	-0.717	68.2	31.8
0.0260	6.00	23.3	26.9	-3.56	25.9	74.1
0.0740	6.00	10.0	8.26	1.74	7.96	92.0

Ryegrass plant height (cm), Day 21; lbs a.i./A

File: 7920gh Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 22.8833 CALCULATED t VALUE = 0.0407
 GRP2 (BLANK CRTL) MEAN = 22.8000 DEGREES OF FREEDOM = 10
 DIFFERENCE IN MEANS = 0.0833

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
 TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Ryegrass plant height (cm), Day 21; lbs a.i./A

File: 7920gh Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.077	7.502	11.842	7.502	2.077
OBSERVED	0	11	7	11	2

Calculated Chi-Square goodness of fit test statistic = 7.3217
 Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

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Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 234.255

W = 0.963

Critical W (P = 0.05) (n = 31) = 0.929
Critical W (P = 0.01) (n = 31) = 0.902

Data PASS normality test at P=0.01 level. Continue analysis.

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 13.33
Closest, conservative, Table H statistic = 69.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 6, df (# reps-1) = 4
Actual values ==> R (# groups) = 6, df (# avg reps-1) = 4.17
(average df used)

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 8.19
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 4.17
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

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Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	236.559	47.312	5.049
Within (Error)	25	234.255	9.370	
Total	30	470.814		

Critical F value = 2.60 (0.05, 5, 25)
Since F > Critical F REJECT Ho: All groups equal

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho: Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED		MEAN CALCULATED IN		T STAT	SIG
		MEAN	ORIGINAL UNITS				
1	neg control	22.883		22.883			
2	0.026	20.300		20.300		1.462	
3	0.041	21.783		21.783		0.622	
4	0.074	18.200		18.200		2.527	*
5	0.16	15.233		15.233		4.329	*
6	0.31	16.750		16.750		2.454	

Bonferroni T table value = 2.49 (1 Tailed Value, P=0.05, df=25, 5)

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho: Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL	
1	neg control	6				
2	0.026	6	4.393	19.2	2.583	
3	0.041	6	4.393	19.2	1.100	
4	0.074	5	4.608	20.1	4.683	
5	0.16	6	4.393	19.2	7.650	
6	0.31	2	6.213	27.2	6.133	

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

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GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	22.883	22.883	22.883
2	0.026	6	20.300	20.300	21.042
3	0.041	6	21.783	21.783	21.042
4	0.074	5	18.200	18.200	18.200
5	0.16	6	15.233	15.233	15.613
6	0.31	2	16.750	16.750	15.613

Ryegrass plant height (cm), Day 21; lbs a.i./A
File: 7920gh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	22.883				
0.026	21.042	1.042		1.71	k= 1, v=25
0.041	21.042	1.042		1.79	k= 2, v=25
0.074	18.200	2.527	*	1.82	k= 3, v=25
0.16	15.613	4.114	*	1.83	k= 4, v=25
0.31	15.613	2.909	*	1.84	k= 5, v=25

s = 3.061

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds	Std.Err.	Lower Bound /Estimate
		Lower	Upper	
EC5	0.011	0.00090	0.12	0.52 0.085
EC10	0.027	0.0044	0.16	0.38 0.16
EC25	0.13	0.049	0.33	0.20 0.38
EC50	0.71	0.19	2.7	0.28 0.27

Slope = 0.899 Std.Err. = 0.342

Goodness of fit: p = 0.18 based on DF= 3.0 25.

7920GH : Ryegrass plant height (cm), Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	22.9	23.1	-0.184	100.	0.00
0.0260	6.00	20.3	20.8	-0.510	90.2	9.78
0.0410	6.00	21.8	20.0	1.77	86.8	13.2
0.0740	5.00	18.2	18.7	-0.531	81.2	18.8
0.160	6.00	15.2	16.6	-1.39	72.0	28.0
0.310	2.00	16.8	14.5	2.27	62.8	37.2

!!!Warning: EC5 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

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Ryegrass % survival, Day 21; lbs a.i./A
File: 7920gs Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 93.3333 CALCULATED t VALUE = -1.5811
GRP2 (BLANK CRTL) MEAN = 100.0000 DEGREES OF FREEDOM = 10
DIFFERENCE IN MEANS = -6.6667

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Ryegrass % survival, Day 21; lbs a.i./A

File: 7920gs Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.345	8.470	13.370	8.470	2.345
OBSERVED	0	14	9	10	2

Calculated Chi-Square goodness of fit test statistic = 7.7110
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Ryegrass % survival, Day 21; lbs a.i./A
File: 7920gs Transform: NO TRANSFORMATION

Shapiro Wilks test for normality.

D = 8933.333

W = 0.871

Critical W (P = 0.05) (n = 35) = 0.934
Critical W (P = 0.01) (n = 35) = 0.910

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Ryegrass % survival, Day 21; lbs a.i./A
File: 7920gs Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has

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zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.048	0.022	0.10	0.16	0.46
EC10	0.061	0.032	0.12	0.14	0.52
EC25	0.090	0.056	0.15	0.10	0.61
EC50	0.14	0.10	0.19	0.067	0.73

Slope = 3.59 Std.Err. = 0.855

Goodness of fit: p = 0.97 based on DE= 3.0 29.

7920GS : Ryegrass % survival, Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	93.3	95.6	-2.22	100.	0.00
0.0260	6.00	100.	95.1	4.87	99.6	0.444
0.0410	6.00	90.0	92.9	-2.85	97.2	2.83
0.0740	5.00	80.0	80.1	-0.0698	83.8	16.2
0.160	6.00	40.0	39.6	0.405	41.4	58.6
0.310	6.00	10.0	10.1	-0.137	10.6	89.4

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

H0:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 62.0333 CALCULATED t VALUE = 0.0960
GRP2 (BLANK CRTL) MEAN = 61.9000 DEGREES OF FREEDOM = 10
DIFFERENCE IN MEANS = 0.1333

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.412	8.712	13.752	8.712	2.412
OBSERVED	2	10	10	14	0

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Calculated Chi-Square goodness of fit test statistic = 6.9062
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 162.402

W = 0.958

Critical W (P = 0.05) (n = 36) = 0.935
Critical W (P = 0.01) (n = 36) = 0.912

Data PASS normality test at P=0.01 level. Continue analysis.

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 16.00
Closest, conservative, Table H statistic = 38.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 6, df (# reps-1) = 5
Actual values ==> R (# groups) = 6, df (# avg reps-1) = 5.00

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 12.70
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 5.00
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

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NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	1574.946	314.989	58.191
Within (Error)	30	162.402	5.413	
Total	35	1737.347		

Critical F value = 2.53 (0.05, 5, 30)
Since F > Critical F REJECT Ho: All groups equal

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2 Ho: Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	62.033	62.033		
2	0.00023	61.917	61.917	0.087	
3	0.0022	60.133	60.133	1.414	
4	0.0029	60.433	60.433	1.191	
5	0.017	52.533	52.533	7.072 *	*
6	0.074	43.900	43.900	13.500 *	*

Dunnett table value = 2.33 (1 Tailed Value, P=0.05, df=30, 5)

Wheat plant height (cm), Day 21; lbs a.i./A
File: 7920wh Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2 Ho: Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	6			
2	0.00023	6	3.130	5.0	0.117
3	0.0022	6	3.130	5.0	1.900
4	0.0029	6	3.130	5.0	1.600
5	0.017	6	3.130	5.0	9.500
6	0.074	6	3.130	5.0	18.133

Wheat plant height (cm), Day 21; lbs a.i./A

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File: 7920wh

Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	62.033	62.033	62.033
2	0.00023	6	61.917	61.917	61.917
3	0.0022	6	60.133	60.133	60.283
4	0.0029	6	60.433	60.433	60.283
5	0.017	6	52.533	52.533	52.533
6	0.074	6	43.900	43.900	43.900

Wheat plant height (cm), Day 21; lbs a.i./A

File: 7920wh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	62.033				
0.00023	61.917	0.087		1.70	k= 1, v=30
0.0022	60.283	1.303		1.78	k= 2, v=30
0.0029	60.283	1.303		1.80	k= 3, v=30
0.017	52.533	7.072	*	1.81	k= 4, v=30
0.074	43.900	13.499	*	1.82	k= 5, v=30

s = 2.327

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0034	0.0016	0.0074	0.16	0.47
EC10	0.0093	0.0054	0.016	0.12	0.58
EC25	0.049	0.039	0.063	0.053	0.78
EC50	0.32	0.21	0.48	0.091	0.65

Slope = 0.838 Std.Err. = 0.0991

Goodness of fit: p = 0.68 based on DF= 3.0 30.

WHT2.TXT : Wheat plant height (cm), Day 21; lbs ai/A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	62.0	62.3	-0.273	100.	0.00
0.000230	6.00	61.9	62.0	-0.124	99.6	0.427
0.00220	6.00	60.1	60.1	0.0262	96.5	3.53
0.00290	6.00	60.4	59.6	0.860	95.6	4.39
0.0174	6.00	52.5	53.2	-0.696	85.4	14.6
0.0740	6.00	43.9	43.7	0.206	70.1	29.9

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!!!!Warning: EC50 not bracketed by doses evaluated.

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	70.2000	CALCULATED t VALUE =	0.5809
GRP2 (BLANK CRTL) MEAN =	67.3333	DEGREES OF FREEDOM =	10
DIFFERENCE IN MEANS =	2.8667		

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.546	9.196	14.516	9.196	2.546
OBSERVED	2	10	16	7	3

Calculated Chi-Square goodness of fit test statistic = 0.9445
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 2108.007

W = 0.979

Critical W (P = 0.05) (n = 38) = 0.938
Critical W (P = 0.01) (n = 38) = 0.916

Data PASS normality test at P=0.01 level. Continue analysis.

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 9.78

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Closest, conservative, Table H statistic = 79.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 7, df (# reps-1) = 4
Actual values ==> R (# groups) = 7, df (# avg reps-1) = 4.43
(average df used)

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 9.21
Table Chi-square value = 16.81 (alpha = 0.01)
Table Chi-square value = 12.59 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 4.43
Used for Chi-square table value ==> df (#groups-1) = 6

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	13960.142	2326.690	34.216
Within (Error)	31	2108.007	68.000	
Total	37	16068.148		

Critical F value = 2.42 (0.05, 6, 30)
Since F > Critical F REJECT Ho:All groups equal

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED	MEAN CALCULATED IN		T STAT	SIG
		MEAN	ORIGINAL UNITS			

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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1	neg control	70.200	70.200	
2	0.000012	64.433	64.433	1.211
3	0.000037	64.600	64.600	1.176
4	0.00012	64.000	64.000	1.302
5	0.00053	44.667	44.667	5.363 *
6	0.0022	17.000	17.000	11.174 *
7	0.0092	24.000	24.000	6.862 *

Bonferroni T table value = 2.53 (1 Tailed Value, P=0.05, df=31,6)

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum (IN ORIG. UNITS)	Sig Diff	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	6				
2	0.000012	6	12.050	17.2	5.767	
3	0.000037	6	12.050	17.2	5.600	
4	0.00012	6	12.050	17.2	6.200	
5	0.00053	6	12.050	17.2	25.533	
6	0.0022	6	12.050	17.2	53.200	
7	0.0092	2	17.041	24.3	46.200	

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	70.200	70.200	70.200
2	0.000012	6	64.433	64.433	64.517
3	0.000037	6	64.600	64.600	64.517
4	0.00012	6	64.000	64.000	64.000
5	0.00053	6	44.667	44.667	44.667
6	0.0022	6	17.000	17.000	18.750
7	0.0092	2	24.000	24.000	18.750

Bean plant height (cm), Day 21; lbs a.i./A
File: 7920bh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	70.200				
0.000012	64.517	1.194		1.70	k= 1, v=31
0.000037	64.517	1.194		1.78	k= 2, v=31

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

0.00012	64.000	1.302	*	1.80	k= 3, v=31
0.00053	44.667	5.363	*	1.81	k= 4, v=31
0.0022	18.750	10.807	*	1.82	k= 5, v=31
0.0092	18.750	7.641	*	1.83	k= 6, v=31

s = 8.246

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	1.7E-05	2.1E-06	0.00014	0.45	0.12
EC10	4.2E-05	7.1E-06	0.00025	0.38	0.17
EC25	0.00018	5.4E-05	0.00063	0.26	0.29
EC50	0.00096	0.00047	0.0020	0.15	0.49

Slope = 0.940 Std.Err. = 0.188

!!!Poor fit: p = 0.0013 based on DF= 4.0 31.

7920BH : Bean plant height (cm), Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	70.2	70.9	-0.660	100.	0.00
1.20e-05	6.00	64.4	68.3	-3.83	96.3	3.67
3.70e-05	6.00	64.6	64.4	0.232	90.8	9.16
0.000120	6.00	64.0	56.9	7.14	80.2	19.8
0.000530	6.00	44.7	42.3	2.41	59.6	40.4
0.00220	6.00	17.0	26.1	-9.07	36.8	63.2
0.00920	2.00	24.0	12.6	11.4	17.8	82.2

Bean % survival, Day 21; lbs a.i./A
File: 7920bs Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	0	4	35	2	1

Calculated Chi-Square goodness of fit test statistic = 36.6756
Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Bean % survival, Day 21; lbs a.i./A
File: 7920bs Transform: NO TRANSFORMATION

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

PMRA Document ID: 1547210

EPA MRID Number: 47127920

Shapiro Wilks test for normality

D = 866.667

W = 0.621

Critical W ($P = 0.05$) ($n = 42$) = 0.942
Critical W ($P = 0.01$) ($n = 42$) = 0.922

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Bean % survival, Day 21; lbs a.i./A
File: 7920bs Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Bean % survival, Day 21; lbs a.i./A
File: 7920bs Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	165.000
2	0.000012	100.000	100.000	165.000
3	0.000037	100.000	100.000	165.000
4	0.00012	100.000	100.000	165.000
5	0.00053	100.000	100.000	165.000
6	0.0022	23.333	23.333	52.000
7	0.0092	6.667	6.667	26.000

Calculated H Value = -11.504 Critical H Value Table = 12.590
Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Bean % survival, Day 21; lbs a.i./A
File: 7920bs Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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EPA MRID Number: 47127920

GROUP	IDENTIFICATION	TRANSFORMED	ORIGINAL	0	0	0	0	0	0
		MEAN	MEAN	7	6	3	4	5	1
7	0.0092	6.667	6.667	\					
6	0.0022	23.333	23.333	.	\				
3	0.000037	100.000	100.000	*	*	\			
4	0.00012	100.000	100.000	*	*	.	\		
5	0.00053	100.000	100.000	*	*	.	\		
1	neg control	100.000	100.000	*	*	.	\		
2	0.000012	100.000	100.000	*	*	.	\		

* = significant difference ($p=0.05$)

Table q value (0.05, 7) = 3.038

. = no significant difference

SE = 5.624

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.00023	0.00010	0.00050	0.17	0.46
EC10	0.00034	0.00017	0.00066	0.14	0.51
EC25	0.00065	0.00039	0.0011	0.11	0.60
EC50	0.0014	0.00096	0.0019	0.075	0.71

Slope = 2.12 Std.Err. = 0.297

!!!Poor fit: p = 0.024 based on DF= 4.0 35.

7920BS : Bean % survival, Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	100.	103.	-2.67	100.	0.00
1.20e-05	6.00	100.	103.	-2.67	100.	0.000669
3.70e-05	6.00	100.	103.	-2.62	100.	0.0454
0.000120	6.00	100.	101.	-1.36	98.7	1.27
0.000530	6.00	100.	82.9	17.1	80.7	19.3
0.00220	6.00	23.3	33.8	-10.4	32.9	67.1
0.00920	6.00	6.67	4.03	2.64	3.92	96.1

Cabbage plant height (cm), Day 21; lbs a.i./A

File: 7920ah Transform: NO TRANSFORMATION

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 19.0000 CALCULATED t VALUE = -0.0376
 GRP2 (BLANK CRTL) MEAN = 19.0333 DEGREES OF FREEDOM = 10
 DIFFERENCE IN MEANS = -0.0333

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
 TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Cabbage plant height (cm), Day 21; lbs a.i./A

File: 7920ah Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	1	13	16	10	2

Calculated Chi-Square goodness of fit test statistic = 2.1989
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920ah Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 229.514

W = 0.976

Critical W (P = 0.05) (n = 42) = 0.942
Critical W (P = 0.01) (n = 42) = 0.922

Data PASS normality test at P=0.01 level. Continue analysis.

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920ah Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 16.04
Closest, conservative, Table H statistic = 42.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 7, df (# reps-1) = 5
Actual values ==> R (# groups) = 7, df (# avg reps-1) = 5.00

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920ah Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 13.78

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Table Chi-square value = 16.81 (alpha = 0.01)

Table Chi-square value = 12.59 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 5.00

Used for Chi-square table value ==> df (#groups-1) = 6

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920aha Transform: NO TRANSFORM

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	306.486	51.081	7.789
Within (Error)	35	229.514	6.558	
Total	41	536.000		

Critical F value = 2.42 (0.05, 6, 30)

Since F > Critical F REJECT Ho:All groups equal

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920aha Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	19.000	19.000		
2	0.0013	21.000	21.000	-1.353	
3	0.0027	19.600	19.600	-0.406	
4	0.0052	19.217	19.217	-0.147	
5	0.0096	13.233	13.233	3.900 *	
6	0.020	14.813	14.813	2.832 *	
7	0.038	15.550	15.550	2.333	

Dunnett table value = 2.40 (1 Tailed Value, P=0.05, df=30, 6)

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920aha Transform: NO TRANSFORM

DUNNETTS TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	6			
2	0.0013	6	3.548	18.7	-2.000

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3	0.0027	6	3.548	18.7	-0.600
4	0.0052	6	3.548	18.7	-0.217
5	0.0096	6	3.548	18.7	5.767
6	0.020	6	3.548	18.7	4.187
7	0.038	6	3.548	18.7	3.450

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920aha Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	19.000	19.000	20.000
2	0.0013	6	21.000	21.000	20.000
3	0.0027	6	19.600	19.600	19.600
4	0.0052	6	19.217	19.217	19.217
5	0.0096	6	13.233	13.233	14.532
6	0.020	6	14.813	14.813	14.532
7	0.038	6	15.550	15.550	14.532

Cabbage plant height (cm), Day 21; lbs a.i./A
File: 7920aha Transform: NO TRANSFORM

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	20.000				
0.0013	20.000	0.676		1.69	k= 1, v=35
0.0027	19.600	0.406		1.77	k= 2, v=35
0.0052	19.217	0.147		1.79	k= 3, v=35
0.0096	14.532	3.022	*	1.80	k= 4, v=35
0.020	14.532	3.022	*	1.81	k= 5, v=35
0.038	14.532	3.022	*	1.82	k= 6, v=35

s = 2.561

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err. /Estimate	Lower Bound
		Lower	Upper		
EC5	0.0014	4.7E-05	0.040	0.72	0.034
EC10	0.0040	0.00035	0.045	0.52	0.088
EC25	0.024	0.0074	0.079	0.25	0.31
EC50	0.18	0.029	1.1	0.39	0.16

Slope = 0.777 Std.Err. = 0.365

!!!Poor fit: p = 0.0027 based on DF= 4.0 35.

7920AH : Cabbage plant height (cm), Day 21; lbs a.i./A

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	19.0	20.2	-1.18	100.	0.00
0.00130	6.00	21.0	19.2	1.79	95.2	4.83
0.00270	6.00	19.6	18.6	1.00	92.1	7.85
0.00520	6.00	19.2	17.8	1.38	88.4	11.6
0.00960	6.00	13.2	16.9	-3.69	83.8	16.2
0.0200	6.00	14.8	15.5	-0.732	77.0	23.0
0.0380	6.00	15.5	14.1	1.43	69.9	30.1

!!!Warning: EC50 not bracketed by doses evaluated.

Cabbage % survival, Day 21; lbs a.i./A

File: 7920as Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	2	8	21	8	3

Calculated Chi-Square goodness of fit test statistic = 2.7001

Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Cabbage % survival, Day 21; lbs a.i./A

File: 7920as Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 5200.000

W = 0.931

Critical W (P = 0.05) (n = 42) = 0.942

Critical W (P = 0.01) (n = 42) = 0.922

Data PASS normality test at P=0.01 level. Continue analysis.

Cabbage % survival, Day 21; lbs a.i./A

File: 7920as Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Cabbage % survival, Day 21; lbs a.i./A
File: 7920as Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	195.000
2	0.0013	100.000	100.000	195.000
3	0.0027	93.333	93.333	171.000
4	0.0052	90.000	90.000	166.000
5	0.0096	56.667	56.667	84.000
6	0.020	40.000	40.000	52.000
7	0.038	33.333	33.333	40.000

Calculated H Value = -859.333 Critical H Value Table = 12.590
Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Cabbage % survival, Day 21; lbs a.i./A
File: 7920as Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	1
7	0.038	33.333	33.333	\						
6	0.020	40.000	40.000	.	\					
5	0.0096	56.667	56.667	.	.	\				
4	0.0052	90.000	90.000	*	.	.	\			
3	0.0027	93.333	93.333	*	.	.	\			
2	0.0013	100.000	100.000	*	*	.	.	\		
1	neg control	100.000	100.000	*	*	.	.	\		

* = significant difference ($p=0.05$)
Table q value (0.05, 7) = 3.038

. = no significant difference
SE = 6.648

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0013	0.00043	0.0038	0.23	0.34
EC10	0.0022	0.00089	0.0055	0.20	0.40
EC25	0.0056	0.0030	0.010	0.13	0.53
EC50	0.016	0.011	0.022	0.077	0.70

Slope = 1.51 Std.Err. = 0.252

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Goodness of fit: p = 0.12 based on DF= 4.0 35.

7920AS : Cabbage % survival, Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	100.	104.	-4.13	100.	0.00
0.00130	6.00	100.	98.8	1.18	94.9	5.10
0.00270	6.00	93.3	91.2	2.14	87.6	12.4
0.00520	6.00	90.0	79.7	10.3	76.5	23.5
0.00960	6.00	56.7	65.1	-8.46	62.5	37.5
0.0200	6.00	40.0	45.3	-5.32	43.5	56.5
0.0380	6.00	33.3	29.1	4.26	27.9	72.1

!!!Warning: EC5 not bracketed by doses evaluated.

Lettuce % survival, Day 21, lbs a.i./A

File: 79201s Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	0	1	40	1	0

Calculated Chi-Square goodness of fit test statistic = 57.9225

Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Lettuce % survival, Day 21, lbs a.i./A

File: 79201s Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 2200.000

W = 0.513

Critical W (P = 0.05) (n = 42) = 0.942

Critical W (P = 0.01) (n = 42) = 0.922

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Lettuce % survival, Day 21, lbs a.i./A
File: 79201s Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Lettuce % survival, Day 21, lbs a.i./A
File: 79201s Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	183.000
2	0.000012	100.000	100.000	183.000
3	0.000037	100.000	100.000	183.000
4	0.000012	100.000	100.000	183.000
5	0.00053	50.000	50.000	93.000
6	0.0022	0.000	0.000	39.000
7	0.0092	0.000	0.000	39.000

Calculated H Value = -39.158 Critical H Value Table = 12.590
Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Lettuce % survival, Day 21, lbs a.i./A
File: 79201s Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	0
6	0.0022	0.000	0.000	\						
7	0.0092	0.000	0.000	.	\					
5	0.00053	50.000	50.000	.	.	\				
4	0.000012	100.000	100.000	*	*	.	\			
1	neg control	100.000	100.000	*	*	.	.	\		
2	0.000012	100.000	100.000	*	*	.	.	.	\	
3	0.000037	100.000	100.000	*	*	.	.	.	\	

* = significant difference ($p=0.05$)
Table q value (0.05, 7) = 3.038

. = no significant difference
SE = 6.297

Oilseed rape plant height (cm), Day 21; lbs a.i./A

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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File: 7920oh Transform: NO TRANSFORMATION

t-test of Solvent and Blank Controls

Ho: GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	35.6333	CALCULATED t VALUE =	0.4415
GRP2 (BLANK CRTL) MEAN =	34.7000	DEGREES OF FREEDOM =	10
DIFFERENCE IN MEANS =	0.9333		

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Oilseed rape plant height (cm), Day 21; lbs a.i./A

File: 7920oh Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.747	9.922	15.662	9.922	2.747
OBSERVED	1	15	11	10	4

Calculated Chi-Square goodness of fit test statistic = 5.6698
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 657.090

W = 0.979

Critical W (P = 0.05) (n = 41) = 0.941
Critical W (P = 0.01) (n = 41) = 0.920

Data PASS normality test at P=0.01 level. Continue analysis.

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 11.22
Closest, conservative, Table H statistic = 42.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 7, df (# reps-1) = 5
Actual values ==> R (# groups) = 7, df (# avg reps-1) = 4.86
(average df used)

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Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 7.21
Table Chi-square value = 16.81 (alpha = 0.01)
Table Chi-square value = 12.59 (alpha = 0.05)

Average df used in cálculación ==> df (avg n - 1) = 4.86
Used for Chi-square table value ==> df (#groups-1) = 6

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	246.566	41.094	2.126
Within (Error)	34	657.090	19.326	
Total	40	903.656		

Critical F value = 2.42 (0.05, 6, 30)
Since F < Critical F FAIL TO REJECT Ho:All groups equal

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	35.633	35.633		
2	0.0013	35.900	35.900	-0.105	
3	0.0027	34.433	34.433	0.473	
4	0.0052	35.083	35.083	0.217	
5	0.0096	32.533	32.533	1.221	

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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6	0.020	31.967	31.967	1.445
7	0.038	28.120	28.120	2.822 *

Bonferroni T table value = 2.52 (1 Tailed Value, P=0.05, df=34, 6)

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

BONFERRONI T-TEST

TABLE 2 OF 2

Ho: Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	6			
2	0.0013	6	6.393	17.9	-0.267
3	0.0027	6	6.393	17.9	1.200
4	0.0052	6	6.393	17.9	0.550
5	0.0096	6	6.393	17.9	3.100
6	0.020	6	6.393	17.9	3.667
7	0.038	5	6.706	18.8	7.513

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	35.633	35.633	35.767
2	0.0013	6	35.900	35.900	35.767
3	0.0027	6	34.433	34.433	34.758
4	0.0052	6	35.083	35.083	34.758
5	0.0096	6	32.533	32.533	32.533
6	0.020	6	31.967	31.967	31.967
7	0.038	5	28.120	28.120	28.120

Oilseed rape plant height (cm), Day 21; lbs a.i./A
File: 7920oh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model)

TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	35.767				
0.0013	35.767	0.053		1.70	k= 1, v=34
0.0027	34.758	0.345		1.78	k= 2, v=34
0.0052	34.758	0.345		1.80	k= 3, v=34
0.0096	32.533	1.221		1.81	k= 4, v=34
0.020	31.967	1.445		1.82	k= 5, v=34
0.038	28.120	2.822 *		1.83	k= 6, v=34

s = 4.396

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0077	0.0011	0.055	0.42	0.14
EC10	0.016	0.0046	0.053	0.26	0.30
EC25	0.052	0.022	0.12	0.18	0.44
EC50	0.19	0.023	1.6	0.46	0.12

Slope = 1.17 Std.Err. = 0.685

Goodness of fit: p = 0.95 based on DF= 4.0 34.

7920OH : Oilseed rape plant height (cm), Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
0.00	6.00	35.6	35.6	-0.0101	100.	0.00
0.00130	6.00	35.9	35.4	0.451	99.5	0.545
0.00270	6.00	34.4	35.1	-0.681	98.5	1.48
0.00520	6.00	35.1	34.5	0.608	96.7	3.28
0.00960	6.00	32.5	33.4	-0.863	93.7	6.30
0.0200	6.00	32.0	31.2	0.732	87.6	12.4
0.0380	5.00	28.1	28.4	-0.284	79.7	20.3

!!!Warning: EC25 not bracketed by doses evaluated.

!!!Warning: EC50 not bracketed by doses evaluated.

Oilseed rape % survival, Day 21; lbs a.i./A

File: 7920os Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	1	6	25	10	0

Calculated Chi-Square goodness of fit test statistic = 10.6913

Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7920os Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 11400.000

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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W = 0.860

Critical W (P = 0.05) (n = 42) = 0.942

Critical W (P = 0.01) (n = 42) = 0.922

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7920os Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7920os Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	165.000
2	0.0013	100.000	100.000	165.000
3	0.0027	100.000	100.000	165.000
4	0.0052	96.667	96.667	148.000
5	0.0096	93.333	93.333	131.000
6	0.020	70.000	70.000	96.500
7	0.038	43.333	43.333	32.500

Calculated H Value = -7.426 Critical H Value Table = 12.590
Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Oilseed rape % survival, Day 21; lbs a.i./A
File: 7920os Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED	ORIGINAL	GROUP					
		MEAN	MEAN	0	0	0	0	0	0
7	0.038	43.333	43.333	\					
6	0.020	70.000	70.000	\					

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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5	0.0096	93.333	93.333	.	.	\
4	0.0052	96.667	96.667	*	.	\
2	0.0013	100.000	100.000	*	.	\
3	0.0027	100.000	100.000	*	.	\
1	neg control	100.000	100.000	*	.	\

* = significant difference ($p=0.05$)
Table q value (0.05, 7) = 3.038

. = no significant difference
SE = 5.642

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	0.0076	0.0029	0.020	0.21	0.38
EC10	0.010	0.0049	0.023	0.16	0.46
EC25	0.018	0.011	0.028	0.099	0.63
EC50	0.033	0.025	0.042	0.056	0.77

Slope = 2.60 Std.Err. = 0.813

Goodness of fit: p = 1.0 based on DF= 4.0 35.

7920OS : Oilseed rape % survival, Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change.
0.00	6.00	100.	100.	0.0192	100.	0.00
0.00130	6.00	100.	100.	0.0331	100.	0.0139
0.00270	6.00	100.	99.7	0.267	99.8	0.248
0.00520	6.00	96.7	98.1	-1.39	98.1	1.92
0.00960	6.00	93.3	91.6	1.75	91.6	8.40
0.0200	6.00	70.0	70.9	-0.897	70.9	29.1
0.0380	6.00	43.3	43.1	0.223	43.1	56.9

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORM

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 62.8000 CALCULATED t VALUE = -0.2599
GRP2 (BLANK CRTL) MEAN = 64.1000 DEGREES OF FREEDOM = 10
DIFERENCE IN MEANS = -1.3000

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814

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OBSERVED	5	5	16	16	0
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Calculated Chi-Square goodness of fit test statistic = 10.4869
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 1581.328

W = 0.978

Critical W (P = 0.05) (n = 42) = 0.942
Critical W (P = 0.01) (n = 42) = 0.922

Data PASS normality test at P=0.01 level. Continue analysis.

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 16.98
Closest, conservative, Table H statistic = 42.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 7, df (# reps-1) = 5
Actual values ==> R (# groups) = 7, df (# avg reps-1) = 5.00

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

Bartletts test for homogeneity of variance

Calculated B statistic = 7.70
Table Chi-square value = 16.81 (alpha = 0.01)
Table Chi-square value = 12.59 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 5.00
Used for Chi-square table value ==> df (#groups-1) = 6

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	6	10527.916	1754.653	38.836
Within (Error)	35	1581.328	45.181	
Total	41	12109.244		

Critical F value = 2.42 (0.05, 6, 30)
Since F > Critical F REJECT Ho:All groups equal

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	neg control	62.800	62.800		
2	0.000012	64.133	64.133	-0.344	
3	0.000066	59.600	59.600	0.825	
4	0.00028	59.333	59.333	0.893	
5	0.0011	41.333	41.333	5.532 *	*
6	0.0031	30.333	30.333	8.366 *	*
7	0.013	22.350	22.350	10.423 *	*

Dunnett table value = 2.40 (1 Tailed Value, P=0.05, df=30, 6)

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	neg control	6			
2	0.000012	6	9.314	14.8	-1.333
3	0.000066	6	9.314	14.8	3.200
4	0.00028	6	9.314	14.8	3.467
5	0.0011	6	9.314	14.8	21.467
6	0.0031	6	9.314	14.8	32.467
7	0.013	6	9.314	14.8	40.450

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Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	62.800	62.800	63.467
2	0.000012	6	64.133	64.133	63.467
3	0.000066	6	59.600	59.600	59.600
4	0.00028	6	59.333	59.333	59.333
5	0.0011	6	41.333	41.333	41.333
6	0.0031	6	30.333	30.333	30.333
7	0.013	6	22.350	22.350	22.350

Soybean plant height (cm), Day 21; lbs a.i./A
File: 7920sh Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	63.467				
0.000012	63.467	0.172		1.69	k= 1, v=35
0.000066	59.600	0.825		1.77	k= 2, v=35
0.00028	59.333	0.893		1.79	k= 3, v=35
0.0011	41.333	5.532 *		1.80	k= 4, v=35
0.0031	30.333	8.366 *		1.81	k= 5, v=35
0.013	22.350	10.423 *		1.82	k= 6, v=35

s = 6.722

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	4.2E-05	1.1E-05	0.00017	0.30	0.25
EC10	0.00011	3.6E-05	0.00035	0.24	0.32
EC25	0.00058	0.00028	0.0012	0.16	0.47
EC50	0.0036	0.0024	0.0055	0.089	0.66

Slope = 0.853 Std.Err. = 0.109

Goodness of fit: p = 0.091 based on DF= 4.0 35.

7920SH : Soybean plant height (cm), Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred.	Pred. %Control	%Change
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Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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0.00	6.00	62.8	64.7	-1.94	100.	0.00
1.20e-05	6.00	64.1	63.6	0.520	98.3	1.73
6.60e-05	6.00	59.6	60.2	-0.649	93.1	6.93
0.000280	6.00	59.3	53.6	5.74	82.8	17.2
0.00110	6.00	41.3	43.4	-2.02	67.0	33.0
0.00310	6.00	30.3	33.8	-3.47	52.2	47.8
0.0130	6.00	22.3	20.5	1.81	31.7	68.3

Soybean % survival, Day 21; lbs a.i./A
File: 7920ss Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	1	0	38	3	0

Calculated Chi-Square goodness of fit test statistic = 49.2433
Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Soybean % survival, Day 21; lbs a.i./A
File: 7920ss Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 2733.333

W = 0.413

Critical W (P = 0.05) (n = 42) = 0.942
Critical W (P = 0.01) (n = 42) = 0.922

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Soybean % survival, Day 21; lbs a.i./A
File: 7920ss Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

Soybean % survival, Day 21; lbs a.i./A
File: 7920ss Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	100.000	100.000	138.000
2	0.000012	100.000	100.000	138.000
3	0.000066	100.000	100.000	138.000
4	0.00028	100.000	100.000	138.000
5	0.0011	100.000	100.000	138.000
6	0.0031	100.000	100.000	138.000
7	0.013	83.333	83.333	75.000

Calculated H Value = 2.172 Critical H Value Table = 12.590
Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Soybean % survival, Day 21; lbs a.i./A
File: 7920ss Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	1
7	0.013	83.333	83.333	\						
2	0.000012	100.000	100.000	.	\					
3	0.000066	100.000	100.000	.	.	\				
4	0.00028	100.000	100.000	.	.	.	\			
5	0.0011	100.000	100.000	.	.	.	.	\
6	0.0031	100.000	100.000	.	.	.	.	.	\
1	neg control	100.000	100.000	.	.	.	.	.	.	\

* = significant difference ($p=0.05$) . = no significant difference
Table q value (0.05, 7) = 3.038 SE = 7.376

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho: GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	51.0167	CALCULATED t VALUE =	0.5727
GRP2 (BLANK CRTL) MEAN =	49.3667	DEGREES OF FREEDOM =	10
DIFFERENCE IN MEANS =	1.6500		

TABLE t VALUE (0.05 (2), 10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 10) = 3.169 NO significant difference at alpha=0.01

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Tomato plant height (cm), Day 21; lbs a.i./A

File: 7920th Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.608	5.808	9.168	5.808	1.608
OBSERVED	2	6	7	9	0

Calculated Chi-Square goodness of fit test statistic = 3.9769

Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 315.250

W = 0.934

Critical W (P = 0.05) (n = 24) = 0.916

Critical W (P = 0.01) (n = 24) = 0.884

Data PASS normality test at P=0.01 level. Continue analysis.

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Calculated H statistic (max Var/min Var) = 3.66

Closest, conservative, Table H statistic = 28.0 (alpha = 0.01)

Used for Table H ==> R (# groups) = 4, df (# reps-1) = 5
Actual values ==> R (# groups) = 4, df (# avg reps-1) = 5.00

Data PASS homogeneity test. Continue analysis.

NOTE: This test requires equal replicate sizes. If they are unequal but do not differ greatly, the Hartley test may still be used as an approximate test (average df are used).

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Bartletts test for homogeneity of variance

Calculated B statistic = 3.41
Table Chi-square value = 11.34 (alpha = 0.01)
Table Chi-square value = 7.81 (alpha = 0.05)

Average df used in calculation ==> df (avg n - 1) = 5.00
Used for Chi-square table value ==> df (#groups-1) = 3

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	3	1231.875	410.625	26.052
Within (Error)	20	315.250	15.762	
Total	23	1547.125		

Critical F value = 3.10 (0.05, 3, 20)
Since F > Critical F REJECT Ho:All groups equal

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 1 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T. STAT	SIG
1	neg control	51.017	51.017		
2	0.000012	50.100	50.100	0.400	
3	0.000066	47.517	47.517	1.527	
4	0.00028	33.267	33.267	7.744 *	

Dunnett table value = 2.19 (1 Tailed Value, P=0.05, df=20, 3)

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

DUNNETTS TEST - TABLE 2 OF 2

Ho:Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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1	neg control	6			
2	0.000012	6	5.020	9.8	0.917
3	0.000066	6	5.020	9.8	3.500
4	0.00028	6	5.020	9.8	17.750

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	neg control	6	51.017	51.017	51.017
2	0.000012	6	50.100	50.100	50.100
3	0.000066	6	47.517	47.517	47.517
4	0.00028	6	33.267	33.267	33.267

Tomato plant height (cm), Day 21; lbs a.i./A
File: 7920th Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
neg control	51.017				
0.000012	50.100	0.400		1.72	k= 1, v=20
0.000066	47.517	1.527		1.81	k= 2, v=20
0.00028	33.267	7.744	*	1.83	k= 3, v=20

s = 3.970

Note: df used for table values are approximate when v > 20.

Estimates of EC%

Parameter	Estimate	95% Bounds		Std.Err.	Lower Bound /Estimate
		Lower	Upper		
EC5	5.7E-05	2.1E-05	0.00016	0.21	0.36
EC10	9.1E-05	4.4E-05	0.00019	0.15	0.48
EC25	0.00020	0.00014	0.00028	0.068	0.72
EC50	0.00047	0.00032	0.00069	0.080	0.68

Slope = 1.80 Std.Err. = 0.528

Goodness of fit: p = 0.75 based on DF= 1.0 20.

7920TH : Tomato plant height (cm), Day 21; lbs a.i./A

Observed vs. Predicted Treatment Group Means

Dose	#Reps.	Obs. Mean	Pred. Mean	Obs. -Pred. %Control	Pred. %Change
0.00	6.00	51.0	50.6	0.386 100.	0.00

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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1.20e-05	6.00	50.1	50.5	-0.426	99.8	0.207
6.60e-05	6.00	47.5	47.5	0.0464	93.8	6.24
0.000280	6.00	33.3	33.3	-0.00589	65.7	34.3

!!!Warning: EC50 not bracketed by doses evaluated.

Tomato % survival, Day 21; lbs a.i./A
File: 7920ts Transform: NO TRANSFORM

t-test of Solvent and Blank Controls

Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN = 93.3333 CALCULATED t VALUE = -0.4472
GRP2 (BLANK CRTL) MEAN = 96.6667 DEGREES OF FREEDOM = 10
DIFFERENCE IN MEANS = -3.3333

TABLE t VALUE (0.05 (2),10) = 2.228 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2),10) = 3.169 NO significant difference at alpha=0.01

Tomato % survival, Day 21; lbs a.i./A
File: 7920ts Transform: NO TRANSFORMATION

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	2.814	10.164	16.044	10.164	2.814
OBSERVED	2	0	39	0	1

Calculated Chi-Square goodness of fit test statistic = 54.5786
Table Chi-Square value (alpha = 0.01) = 13.277

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Tomato % survival, Day 21; lbs a.i./A
File: 7920ts Transform: NO TRANSFORMATION

Shapiro Wilks test for normality

D = 2000.000

W = 0.667

Critical W (P = 0.05) (n = 42) = 0.942
Critical W (P = 0.01) (n = 42) = 0.922

Data FAIL normality test. Try another transformation.

Warning - The two homogeneity tests are sensitive to non-normal data and should not be performed.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Tomato % survival, Day 21; lbs a.i./A

File: 7920ts Transform: NO TRANSFORMATION

Hartley test for homogeneity of variance

Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.

Additional transformations are useless.

Tomato % survival, Day 21; lbs a.i./A

File: 7920ts Transform: NO TRANSFORMATION

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	neg control	93.333	93.333	176.500
2	0.000012	100.000	100.000	189.000
3	0.000066	96.667	96.667	177.500
4	0.00028	100.000	100.000	189.000
5	0.0011	3.333	3.333	63.000
6	0.0031	0.000	0.000	54.000
7	0.013	0.000	0.000	54.000

Calculated H Value = -36.845 Critical H Value Table = 12.590

Since Calc H < Crit H FAIL TO REJECT Ho:All groups are equal.

Tomato % survival, Day 21; lbs a.i./A

File: 7920ts Transform: NO TRANSFORMATION

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP						
				0	0	0	0	0	0	0
6	0.0031	0.000	0.000	\						
7	0.013	0.000	0.000	.	\					
5	0.0011	3.333	3.333	.	.	\				
1	neg control	93.333	93.333	*	*	.	\			
3	0.000066	96.667	96.667	*	*	.	\			
4	0.00028	100.000	100.000	*	*	*	.	\		
2	0.000012	100.000	100.000	*	*	*	.	.	\	

* = significant difference (p=0.05)

Table q value (0.05,7) = 3.038

. = no significant difference

SE = 6.297

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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TOTAL DRY WEIGHT STATISTICS (g ai/ha)

IIA 8.12
MRID-47127920
PMRA-1547210
PMRA sub 2008-0431
BAS800 02H veg vigour

Total dry weight was calculated by multiplying the reported average dry weight per living plant and multiplying it by the number of survivors in that pot. Treatments groups were compared to the negative control groups only as per USEPA policy. Replicates with no survivors were not included in the analysis. Hypothesis testing was conducted with Dunnett's test except in cases where the assumptions of normality and equal variances were not met. In these cases, Bonferroni's t-test was used. Point estimates were derived using linear interpolation.

Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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EPA MRID Number: 47127920

Bean

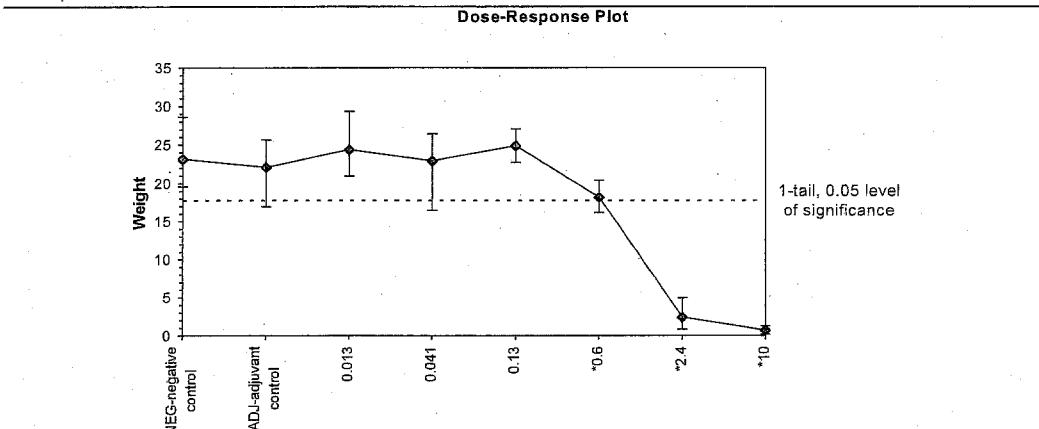
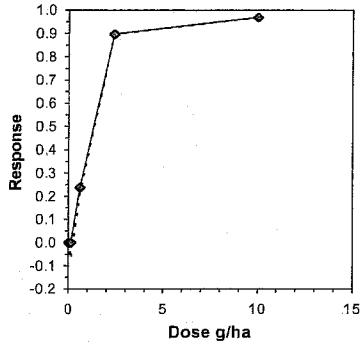
Terrestrial plants-Weight						
Start Date:	Test ID: 1547210		Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International		Sample Type:	EP-end-use product		
Sample Date:	Protocol: 850.4250-OPPTS vegetative Test Species:			CRSP-crop species		
Comments:						

Conc-g/ha	1	2	3	4	5	6
negative control	28.650	22.650	23.900	23.950	20.600	19.600
adjuvant control	17.000	23.300	19.550	24.250	23.000	25.650
0.013	21.000	21.200	22.050	28.350	24.650	29.400
0.041	24.300	16.450	24.700	26.400	20.900	24.450
0.13	26.650	23.250	22.700	26.100	23.500	27.000
0.6	16.150	20.400	17.650	17.400	17.350	20.050
2.4	1.870	4.500	0.930	4.970	0.820	1.440
10	0.160		1.280			

Conc-g/ha	Transform: Untransformed					t-Stat	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max			Mean	N-Mean
negative control	23.225	1.0497	23.225	19.600	28.650	13.721	*	23.850	1.0000
adjuvant control	22.125	1.0000	22.125	17.000	25.650	14.574			
0.013	24.442	1.1047	24.442	21.000	29.400	15.086	-0.767	2.396	3.803
0.041	22.867	1.0335	22.867	16.450	26.400	15.822	6	0.226	2.396
0.13	24.867	1.1239	24.867	22.700	27.000	7.720	6	-1.034	2.396
*0.6	18.167	0.8211	18.167	16.150	20.400	9.251	6	3.187	2.396
*2.4	2.422	0.1095	2.422	0.820	4.970	75.855	6	13.108	3.803
*10	0.720	0.0325	0.720	0.160	1.280	109.994	2	10.027	2.396

Auxiliary Tests		Statistic	Critical	Skew	Kurt					
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)		0.98513	0.938	-0.0023	0.14277					
Bartlett's Test indicates equal variances ($p = 0.32$)		7.02247	16.8119							
The control means are not significantly different ($p = 0.57$)		0.59436	2.22814							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	0.13	0.6	0.27928		5.37803	0.23156	481.092	7.55645	4.6E-16	6, 31
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05	0.2286	0.0798	0.0000	0.2636	-1.0848	
IC10	0.3272	0.0734	0.0000	0.3973	-1.4541	
IC15	0.4259	0.0690	0.1888	0.5398	-0.2731	
IC20	0.5245	0.0733	0.2962	0.6739	0.1411	
IC25	0.6319	0.0831	0.4327	0.8057	0.2595	
IC40	1.0409	0.0820	0.8042	1.2003	-0.0674	
IC50	1.3136	0.0724	1.1165	1.4615	0.0844	



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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EPA MRID Number: 47127920

Lettuce

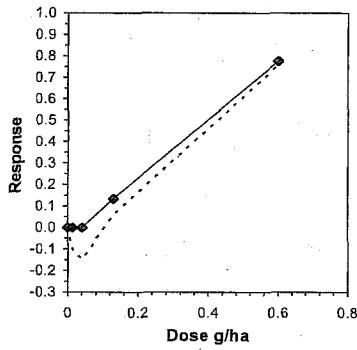
Terrestrial plants-Weight						
Start Date:	Test ID: 1547210		Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International		Sample Type:	EP-end-use product		
Sample Date:	Protocol: 850.4250-OPPTS vegetative Test Species:			CRSP-crop species		
Comments:						
Conc-g/ha	1	2	3	4	5	6
Negative control	7.400	10.400	8.600	9.800	10.800	11.600
Adjuvant control	10.950	9.600	12.100	11.100	9.400	9.550
0.013	10.300	10.300	9.800	12.250	11.100	11.300
0.041	9.550	10.850	10.500	11.550	12.800	12.050
0.13	8.750	8.950	10.250	9.050	9.750	8.350
0.6	2.040	0.290	3.360	2.180	3.750	2.490

Conc-g/ha	Mean	N-Mean	Transform: Untransformed				t-Stat	Critical	MSD	Isotonic	
			Mean	Min	Max	CV%				Mean	N-Mean
Negative control	9.767	0.9346	9.7667	7.4000	11.6000	15.725	6	*		10.608	1.0000
Adjuvant control	10.450	1.0000	10.4500	9.4000	12.1000	10.509	6				
0.013	10.842	1.0375	10.8417	9.8000	12.2500	8.180	6	-1.639	2.274	1.4911	10.608 1.0000
0.041	11.217	1.0734	11.2167	9.5500	12.8000	10.350	6	-2.211	2.274	1.4911	10.608 1.0000
0.13	9.183	0.8788	9.1833	8.3500	10.2500	7.565	6	0.890	2.274	1.4911	9.183 0.8657
0.6	2.352	0.2250	2.3517	0.2900	3.7500	51.621	6	11.309	2.274	1.4911	2.352 0.2217

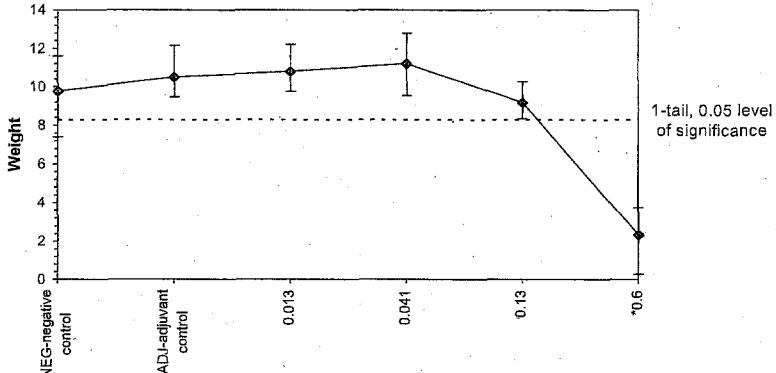
Auxiliary Tests		Statistic	Critical	Skew	Kurt					
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.977	0.927	-0.3354	-0.2224					
Bartlett's Test indicates equal variances (p = 0.52)		3.22672	13.2767							
The control means are not significantly different (p = 0.40)		0.88654	2.22814							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	0.13	0.6	0.27928		1.49105	0.15267	78.8837	1.28981	1.5E-12	4, 25

Treatments vs NEG-negative control

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05	0.0741	0.0114	0.0592 0.1201	1.4470
IC10	0.1073	0.0185	0.0790 0.1674	0.7222
IC15	0.1414	0.0221	0.0977 0.2034	0.3468
IC20	0.1779	0.0239	0.1189 0.2378	0.0319
IC25	0.2144	0.0228	0.1591 0.2716	0.1144
IC40	0.3239	0.0218	0.2722 0.3747	0.2587
IC50	0.3969	0.0235	0.3404 0.4509	0.1589



Dose-Response Plot



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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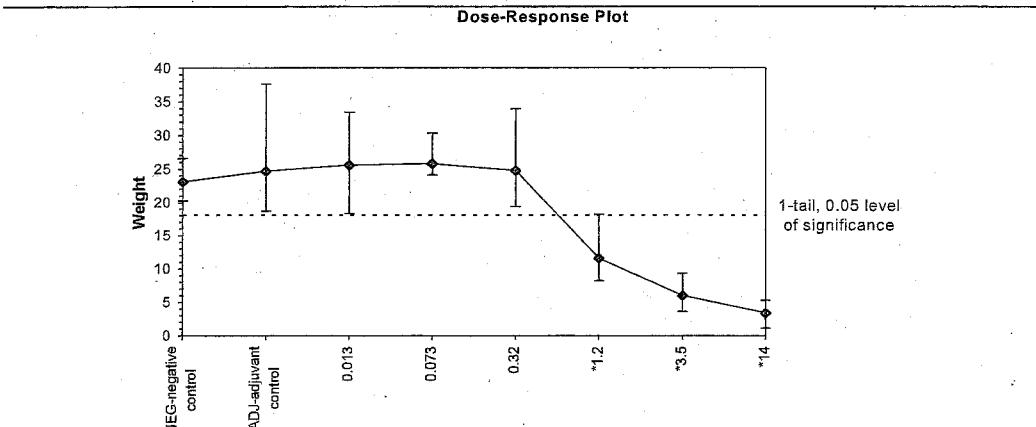
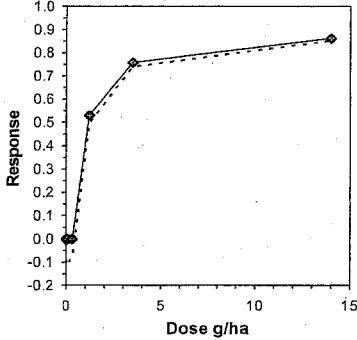
Soybean

Terrestrial plants-Weight						
Start Date:	Test ID: 1547210		Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International		Sample Type:	EP-end-use product		
Sample Date:	Protocol: 850.4250-OPPTS vegetative Test Species:			CRSP-crop species		
Comments:						
Conc-g/ha	1	2	3	4	5	6
Negative control	20.650	20.250	26.350	23.150	26.550	21.600
Adjuvant control	18.650	21.350	22.750	37.600	23.600	24.000
0.013	22.050	33.400	26.050	30.100	18.250	23.550
0.073	25.850	24.150	25.250	24.050	24.950	30.250
0.32	28.150	19.350	22.800	33.950	22.000	22.550
1.2	9.100	18.200	8.650	8.250	11.750	13.800
3.5	6.900	3.600	9.300	6.650	4.750	4.850
*14	3.150	1.140	2.550	5.240	3.320	5.000

Conc-g/ha	Transform: Untransformed					t-Stat	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max			Mean	N-Mean
Negative control	23.092	0.9365	23.092	20.250	26.550	12.070	6	*	24.803 1.0000
Adjuvant control	24.658	1.0000	24.658	18.650	37.600	26.884	6		
0.013	25.567	1.0368	25.567	18.250	33.400	21.574	6	-1.174	2.383 5.022 24.803 1.0000
0.073	25.750	1.0443	25.750	24.050	30.250	8.957	6	-1.261	2.383 5.022 24.803 1.0000
0.32	24.800	1.0057	24.800	19.350	33.950	21.454	6	-0.811	2.383 5.022 24.800 0.9999
*1.2	11.625	0.4714	11.625	8.250	18.200	33.226	6	5.441	2.383 5.022 11.625 0.4687
*3.5	6.008	0.2437	6.008	3.600	9.300	33.919	6	8.106	2.383 5.022 6.008 0.2422
*14	3.400	0.1379	3.400	1.140	5.240	45.269	6	9.344	2.383 5.022 3.400 0.1371

Auxiliary Tests		Statistic	Critical	Skew	Kurt					
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.95117	0.942	0.72012	0.79934					
Bartlett's Test indicates equal variances (p = 0.05)		12.3473	16.8119							
The control means are not significantly different (p = 0.61)		0.53364	2.22814							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	0.32	1.2	0.61968		5.02159	0.21746	582.346	13.3232	7.9E-15	6, 35
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05	0.4026	0.0939	0.0551	0.4213	-1.0937	
IC10	0.4855	0.0812	0.1596	0.5311	-1.2272	
IC15	0.5683	0.0778	0.2406	0.6366	-1.2048	
IC20	0.6511	0.0730	0.3706	0.7421	-0.9355	
IC25	0.7340	0.0689	0.4848	0.8504	-0.2910	
IC40	0.9825	0.0865	0.8078	1.2411	1.3298	
IC50	1.1481	0.1950	0.9532	1.9674	1.9940	



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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PMRA Document ID: 1547210

EPA MRID Number: 47127920

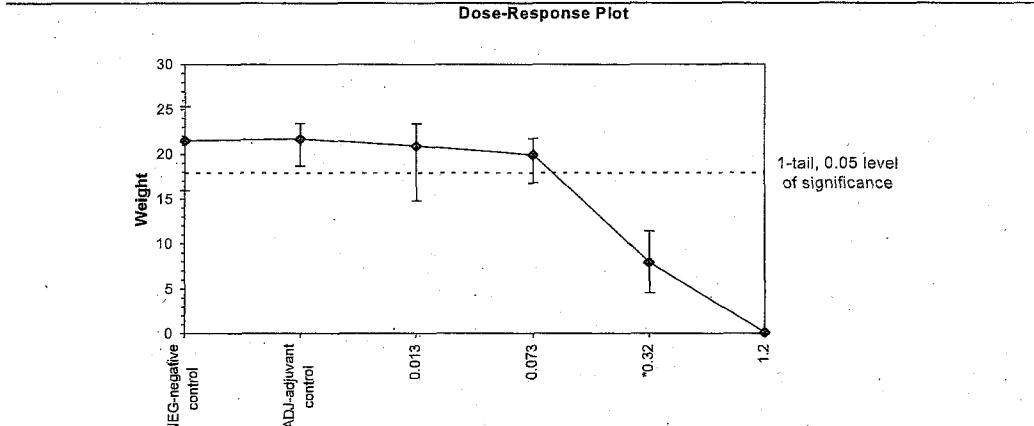
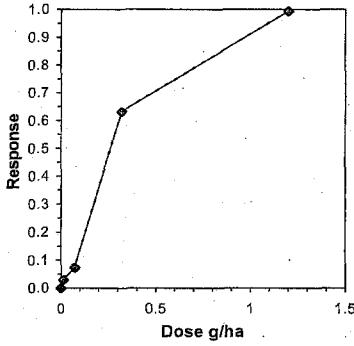
Tomato

Terrestrial plants-Weight						
Start Date:	Test ID: 1547210		Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International		Sample Type:	EP-end-use product		
Sample Date:	Protocol: 850.4250-OPPTS vegetative Test Species:			CRSP-crop species		
Comments:						
Conc-g/ha	1	2	3	4	5	6
negative control	18.900	24.600	15.960	25.350	20.700	23.600
adjuvant control	21.450	20.800	23.450	23.160	22.750	18.700
0.013	14.750	21.600	21.900	21.550	23.400	22.100
0.073	16.760	21.750	20.000	21.500	20.700	18.800
0.32	8.450	5.450	11.400	9.900	7.750	4.550
1.2	0.110					

Conc-g/ha	Transform: Untransformed					N	t-Stat	Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max				Mean	N-Mean
negative control	21.518	0.9908	21.518	15.960	25.350	17.003	*		21.518	1.0000
adjuvant control	21.718	1.0000	21.718	18.700	23.450	8.280	6			
0.013	20.883	0.9616	20.883	14.750	23.400	14.747	6	0.382	2.190	3.641
0.073	19.918	0.9171	19.918	16.760	21.750	9.446	6	0.962	2.190	3.641
*0.32	7.917	0.3645	7.917	4.550	11.400	32.841	6	8.181	2.190	3.641
1.2	0.110	0.0051	0.110	0.110	0.000	1			0.110	0.0051

Auxiliary Tests		Statistic	Critical	Skew	Kurt					
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)		0.93245	0.916	-0.8138	0.07521					
Bartlett's Test indicates equal variances ($p = 0.56$)		2.0422	11.3449							
The control means are not significantly different ($p = 0.91$)		0.12017	2.22814							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	0.073	0.32	0.15284		3.64109	0.16921	250.537	8.29269	1.3E-07	3, 20
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)				
Point	g/ha	SD	95% CL(Exp)	Skew
IC05	0.0404	0.0318	0.0000	0.1098
IC10	0.0844	0.0337	0.0000	0.1238
IC15	0.1065	0.0290	0.0000	0.1453
IC20	0.1286	0.0237	0.0474	0.1672
IC25	0.1508	0.0212	0.0783	0.1932
IC40	0.2172	0.0199	0.1642	0.2620
IC50	0.2615	0.0209	0.2150	0.3159



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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Onion

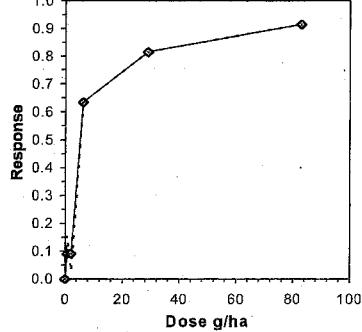
Terrestrial plants-Weight						
Start Date:	Test ID: 1547210			Sample ID: BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International			Sample Type: EP-end-use product		
Comments:	Protocol: 850.4250-OPPTS vegetative Test Species: CRSP-crop species					
Conc-g/ha	1	2	3	4	5	6
negative control	0.4900	0.4200	0.2200	0.5900	0.8200	0.2900
adjuvant control	0.4200	0.4900	0.1500	0.4500	0.5120	0.1500
0.75	0.5400	0.4900	0.4500	0.1900	0.2600	0.4600
2.2	0.4800	0.3600	0.3000	0.6000	0.5700	0.4400
6.3	0.1410	0.0600	0.1520	0.2500	0.3000	0.1320
*29	0.0400	0.1410	0.0810			
*83	0.0600	0.0200				

Conc-g/ha	Transform: Untransformed					t-Stat	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max			Mean	N-Mean
negative control	0.4717	1.3029	0.4717	0.2200	0.8200	45.933	6	*	0.4717 1.0000
adjuvant control	0.3620	1.0000	0.3620	0.1500	0.5120	46.204	6		
0.75	0.3983	1.1004	0.3983	0.1900	0.5400	35.054	6	0.914	2.367 0.1899 0.4283 0.9081
2.2	0.4583	1.2661	0.4583	0.3000	0.6000	25.460	6	0.166	2.367 0.1899 0.4283 0.9081
*6.3	0.1725	0.4765	0.1725	0.0600	0.3000	50.519	6	3.729	2.367 0.1899 0.1725 0.3657
*29	0.0873	0.2413	0.0873	0.0400	0.1410	58.164	3	3.911	2.367 0.2325 0.0873 0.1852
*83	0.0400	0.1105	0.0400	0.0200	0.0600	70.711	2	3.804	2.367 0.2685 0.0400 0.0848

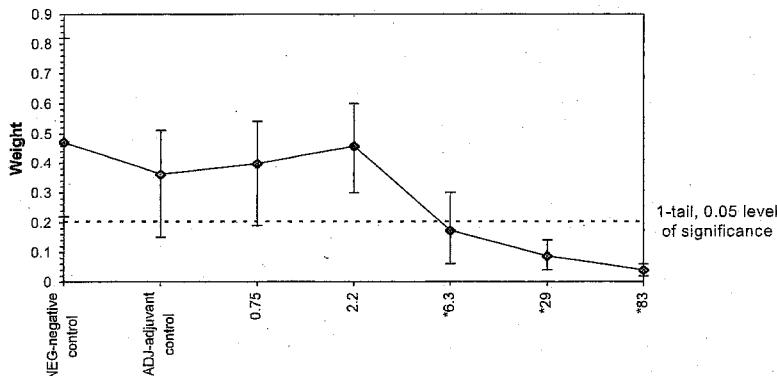
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.97336	0.926	0.27891	0.96392
Bartlett's Test indicates equal variances ($p = 0.16$)	7.94105	15.0863		
The control means are not significantly different ($p = 0.35$)	0.98146	2.22814		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Dunnett's Test	2.2	6.3	3.7229	0.26852
Treatments vs NEG-negative control				0.56931 0.14785 0.01931 2.3E-04 5, 23

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05*	0.4082	1.0543	0.0138 3.2654	0.5754		
IC10	2.2614	1.1470	0.0000 3.2423	-0.1056		
IC15	2.6394	1.1681	0.0000 3.6592	-0.5551		
IC20	3.0173	1.1227	0.0000 4.0762	-0.9993		
IC25	3.3953	1.0835	0.0000 4.5403	-1.2777		
IC40	4.5291	0.8310	2.2097 5.9382	-0.8335		
IC50	5.2850	1.1337	3.4877 10.1017	3.0737		

* indicates IC estimate less than the lowest concentration



Dose-Response Plot



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

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EPA MRID Number: 47127920

Cabbage

Terrestrial plants-Weight						
Start Date:	Test ID:	1547210	Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID:	WI-Wildlife International	Sample Type:	EP-end-use product		
Sample Date:	Protocol:	850.4250-OPPTS vegetative Test Species:			CRSP-crop species	
Comments:						

Conc-g/ha	1	2	3	4	5	6
negative control	15.800	16.150	16.650	12.400	15.400	13.350
adjuvant control	14.000	13.400	16.000	15.150	13.700	14.250
*1.5	11.400	10.550	12.600	12.600	9.300	12.400
*3	9.400	9.200	11.300	7.080	10.200	7.400
*5.8	5.000	9.500	4.140	4.000	9.650	7.300
*11	0.900	2.840	2.310	1.280	0.810	4.650
*22	1.520	1.500	1.800	0.800	2.340	0.600
*43	1.080	0.380	1.520	0.660	0.940	1.050

Conc-g/ha	Transform: Untransformed					N	t-Stat	Critical	MSD	Isotonic	
	Mean	N-Mean	Mean	Min	Max					Mean	N-Mean
negative control	14.958	1.0376	14.958	12.400	16.650	11.313	6	3.902	2.383	2.127	14.958 1.0000
adjuvant control	14.417	1.0000	14.417	13.400	16.000	6.792	6	6.566	2.383	2.127	9.097 0.6081
*1.5	11.475	0.7960	11.475	9.300	12.600	11.678	6	9.365	2.383	2.127	11.475 0.7671
*3	9.097	0.6310	9.097	7.080	11.300	17.808	6	14.368	2.383	2.127	2.132 0.1425
*5.8	6.598	0.4577	6.598	4.000	9.650	39.272	6	15.158	2.383	2.127	6.598 0.4411
*11	2.132	0.1479	2.132	0.810	4.650	69.152	6	15.705	2.383	2.127	0.938 0.0954
*22	1.427	0.0990	1.427	0.600	2.340	45.032	6				
*43	0.938	0.0651	0.938	0.380	1.520	41.552	6				

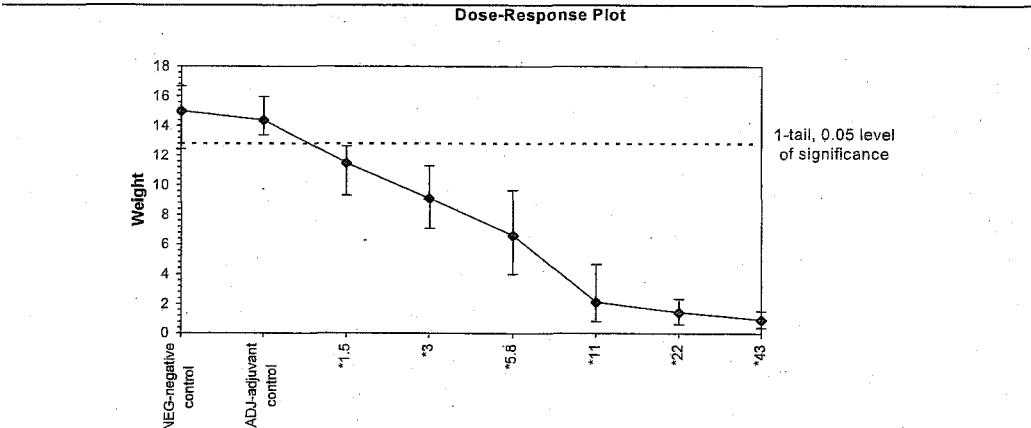
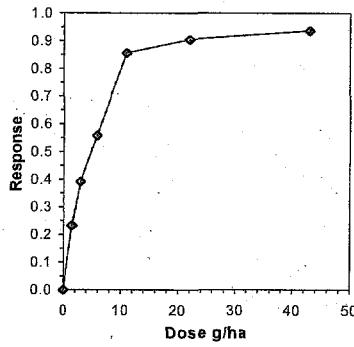
Auxiliary Tests		Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)		0.96693	0.942	0.05369	-0.307
Bartlett's Test indicates equal variances ($p = 0.01$)		16.668	16.8119		
The control means are not significantly different ($p = 0.51$)		0.67867	2.22814		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	<1.5	1.5			2.12721	0.14221	178.619	2.39082	1.7E-18	6, 35

Treatments vs NEG-negative control

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05*	0.3221	0.0807	0.2080	0.6058	1.3817	
IC10*	0.6441	0.1615	0.4161	1.2117	1.3817	
IC15*	0.9662	0.2255	0.6241	1.7480	0.9002	
IC20*	1.2883	0.2699	0.8322	2.0819	0.5026	
IC25	1.6616	0.3342	1.0248	2.4837	0.1843	
IC40	3.1364	0.7561	2.1729	6.6994	1.6991	
IC50	4.8128	0.9379	2.9760	7.6891	0.3932	

* indicates IC estimate less than the lowest concentration



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Oilseed

Terrestrial plants-Weight						
Start Date:	Test ID: 1547210			Sample ID:	BAS8002-12% saflufenacil	
End Date:	Lab ID: WI-Wildlife International			Sample Type:	EP-end-use product	
Sample Date:	Protocol: 850.4250-OPPTS vegetative Test Species:			CRSP-crop species		
Comments:						
Conc-g/ha	1	2	3	4	5	6
negative control	27.400	25.250	29.600	25.550	23.050	22.150
adjuvant control	26.100	30.050	29.550	28.400	26.250	23.750
1.5	24.300	24.700	23.550	26.900	22.150	22.850
3	22.900	24.550	22.200	26.300	23.350	18.900
5.8	22.750	20.500	15.320	20.350	19.400	14.900
11	14.400	11.650	13.000	14.040	13.880	16.250
22	12.550	12.690	7.720	0.910	13.200	15.300
43	8.480	2.590	3.840	4.710	6.450	

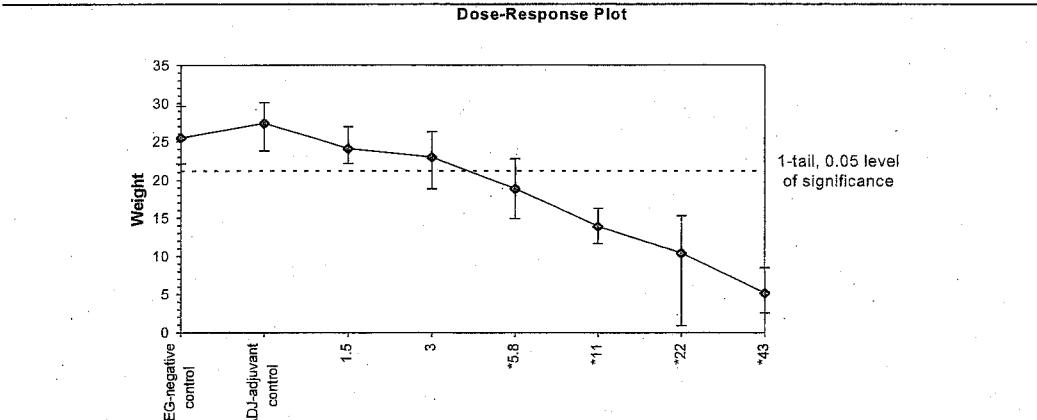
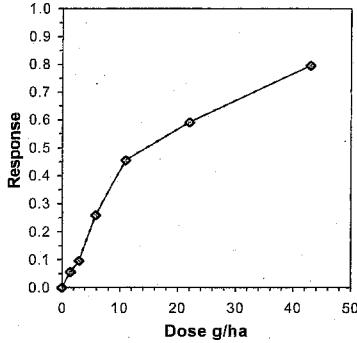
Conc-g/ha	Transform: Untransformed					t-Stat	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max			Mean	N-Mean
negative control	25.500	0.9324	25.500	22.150	29.600	10.770	6	*	
adjuvant control	27.350	1.0000	27.350	23.750	30.050	8.800	6		
1.5	24.075	0.8803	24.075	22.150	26.900	6.927	6	0.827	2.386
3	23.033	0.8422	23.033	18.900	26.300	10.787	6	1.431	2.386
*5.8	18.870	0.6899	18.870	14.900	22.750	16.513	6	3.848	2.386
*11	13.870	0.5071	13.870	11.650	16.250	11.010	6	6.749	2.386
*22	10.395	0.3801	10.395	0.910	15.300	50.715	6	8.766	2.386
*43	5.214	0.1906	5.214	2.590	8.480	44.176	5	11.225	2.386

Auxiliary Tests		Statistic	Critical	Skew	Kurt					
Shapiro-Wilk's Test Indicates normal distribution (p > 0.05)		0.9559	0.941	-0.9198	2.15934					
Bartlett's Test indicates equal variances (p = 0.11)		10.326	16.8119							
The control means are not significantly different (p = 0.24)		1.24094	2.22814							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	3	5.8	4.17133		4.31194	0.1691	329.134	8.90789	1.7E-13	6, 34

Treatments vs NEG-negative control

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05*	1.342	0.874	0.335	4.042	0.8518	
IC10	3.056	0.918	0.558	4.485	-0.3136	
IC15	3.914	0.804	1.227	5.584	-0.5176	
IC20	4.771	0.830	2.228	6.848	-0.2816	
IC25	5.629	0.886	3.538	7.676	-0.0636	
IC40	9.513	1.127	6.713	11.335	0.9362	
IC50	14.545	3.834	9.333	27.298	1.1755	

* indicates IC estimate less than the lowest concentration



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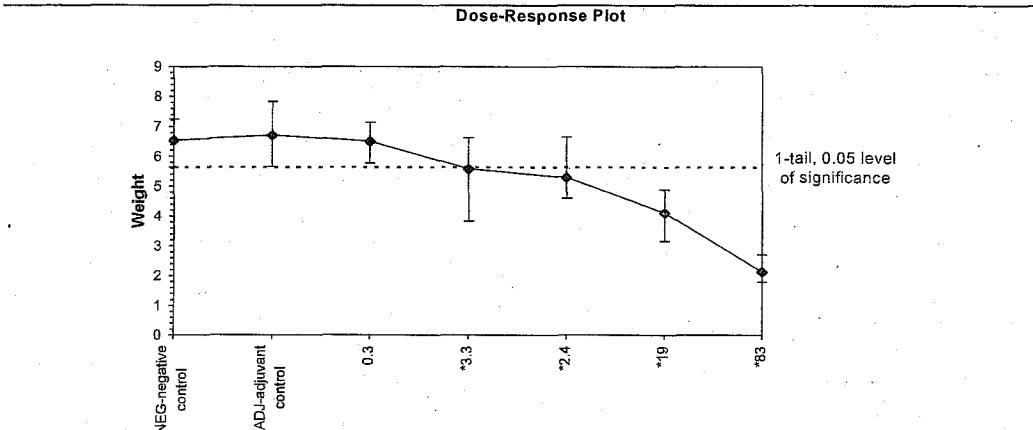
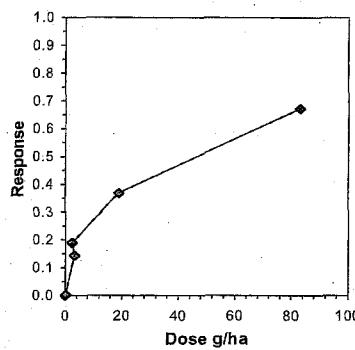
Wheat

Terrestrial plants-Weight						
Start Date:	Test ID: 1547210			Sample ID:	BAS8002-12% saflufenacil	
End Date:	Lab ID: WI-Wildlife International			Sample Type:	EP-end-use product	
Sample Date:	Protocol: 850.4250-OPPTS vegetative Test Species:			CRSP-crop species		
Comments:						
Conc-g/ha	1	2	3	4	5	6
Negative control	5.6300	6.8000	7.2400	6.8000	6.4200	6.3300
Adj-juvnt control	6.4800	5.6600	7.8400	6.5700	7.6000	6.1300
0.3	7.0700	6.6700	6.2400	5.7800	7.1400	6.1600
3.3	6.6300	3.8400	5.9100	6.4500	5.4000	5.3300
2.4	6.6500	5.5200	4.5900	5.1700	5.0400	4.8100
*19	4.8900	3.8200	3.8300	3.1600	4.2900	4.7400
*83	1.9800	2.0100	2.1400	1.8000	2.7100	2.1800

Conc-g/ha	Transform: Untransformed					t-Stat	Critical	MSD	Isotonic	
	Mean	N-Mean	Mean	Min	Max				Mean	N-Mean
Negative control	6.5367	0.9737	6.5367	5.6300	7.2400	8.412	*		6.5367	1.0000
Adj-juvnt control	6.7133	1.0000	6.7133	5.6600	7.8400	12.605	6			
0.3	6.5100	0.9697	6.5100	5.7800	7.1400	8.313	6	0.069	2.330	0.8974
*3.3	5.5933	0.8332	5.5933	3.8400	6.6300	18.038	6	2.449	2.330	0.8974
*2.4	5.2967	0.7890	5.2967	4.5900	6.6500	13.873	6	3.219	2.330	0.8974
*19	4.1217	0.6140	4.1217	3.1600	4.8900	15.731	6	6.270	2.330	0.8974
*83	2.1367	0.3183	2.1367	1.8000	2.7100	14.569	6	11.424	2.330	0.8974

Auxiliary Tests		Statistic	Critical	Skew	Kurt					
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.97848	0.935	-0.274	0.87529					
Bartlett's Test indicates equal variances (p = 0.27)		6.33751	15.0863							
The control means are not significantly different (p = 0.68)		0.42881	2.22814							
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	0.3	3.3	0.99499		0.89744	0.13729	16.8544	0.44506	4.4E-12	5, 30
Treatments vs NEG-negative control										

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05	1.282	0.759	0.000	3.781	0.8541	
IC10	2.352	0.786	0.087	3.559	0.0549	
IC15	3.187	0.797	1.432	5.072	2.7800	
IC20	3.351	1.913	2.158	10.696	1.5709	
IC25	7.969	3.243	0.767	14.654	0.3524	
IC40	25.438	6.239	13.003	40.915	0.2255	
IC50	46.513	5.249	30.823	58.246	-0.3773	



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

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PMRA Document ID: 1547210

EPA MRID Number: 47127920

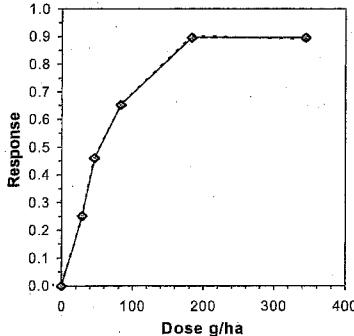
Ryegrass

Terrestrial plants-Weight						
Start Date:	Test ID: 1547210		Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International		Sample Type:	EP-end-use product		
Sample Date:	Protocol: 850.4250-OPPTS vegetative			Test Species: CRSP-crop species		
Comments:	Conc-g/ha	1	2	3	4	5
negative control	2.0000	2.2500	1.5320	3.1200	4.6500	3.6700
adjuvant control	2.0500	0.8500	2.4700	2.5100	3.8500	3.2500
29	1.3600	1.5200	1.9300	2.3700	2.3100	3.4000
*46	1.3400	1.4600	1.1920	0.9000	1.7600	2.6300
*83	0.8920	0.6000	0.7100	1.1190	1.6600	
*183	0.1100	0.3200	0.5100	0.4800	0.2000	0.0700
*344	0.2100	0.4200				
Conc-g/ha	1	2	3	4	5	6

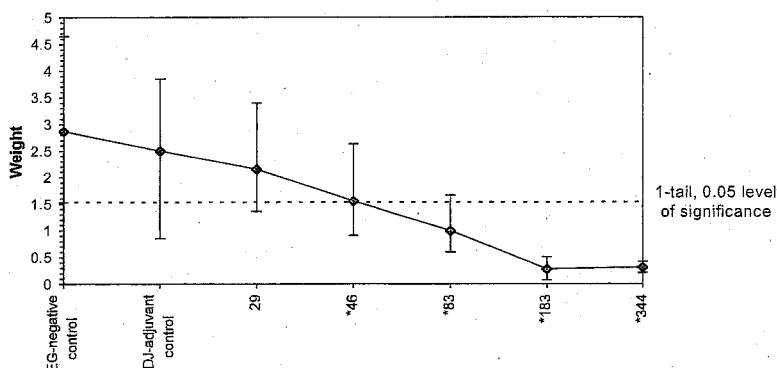
Conc-g/ha	Transform: Untransformed					N	t-Stat	1-Tailed		Isotonic	
	Mean	N-Mean	Mean	Min	Max			Critical	MSD	Mean	N-Mean
negative control	2.8703	1.1497	2.8703	1.5320	4.6500	40.636	6	*		2.8703	1.0000
adjuvant control	2.4967	1.0000	2.4967	0.8500	3.8500	41.280	6				
29	2.1483	0.8605	2.1483	1.3600	3.4000	34.243	6	1.788	2.354	0.9503	2.1483
*46	1.5470	0.6196	1.5470	0.9000	2.6300	38.928	6	3.278	2.354	0.9503	1.5470
*83	0.9962	0.3990	0.9962	0.6000	1.6600	42.156	5	4.426	2.354	0.9967	0.9962
*183	0.2817	0.1128	0.2817	0.0700	0.5100	66.208	6	6.412	2.354	0.9503	0.2983
*344	0.3150	0.1262	0.3150	0.2100	0.4200	47.140	2	4.476	2.354	1.3439	0.2983
											0.1039

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution ($p > 0.05$)	0.95091	0.929	0.72111	1.37997
Bartlett's Test indicates equal variances ($p = 0.01$)	14.341	15.0863		
The control means are not significantly different ($p = 0.57$)	0.58805	2.22814		
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Dunnett's Test	29	46	36.524	1.34394
Treatments vs NEG-negative control				0.46822
				5.35689
				0.48892
				1.2E-05
				5, 25

* indicates IC estimate less than the lowest concentration



Dose-Response Plot



Data Evaluation Report on the Acute Toxicity of BAS 800 02 H (Saflufenacil) to Terrestrial Vascular Plants: Vegetative Vigor

PMRA Submission Number: 2008-0431

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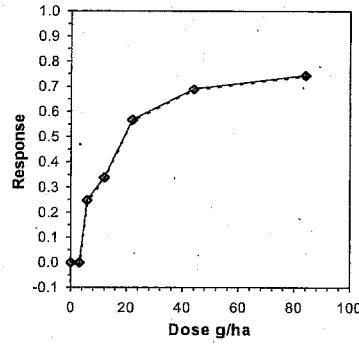
Corn

Terrestrial plants-Weight						
Start Date:	Test ID: 1547210		Sample ID:	BAS8002-12% saflufenacil		
End Date:	Lab ID: WI-Wildlife International		Sample Type:	EP-end-use product		
Comments:	Protocol: 850.4250-OPPTS vegetative Test Species: CRSP-crop species					
Conc-g/ha	1	2	3	4	5	6
negative control	18.150	25.750	28.600	18.750	19.450	16.350
adjuvant control	26.850	22.950	19.450	21.000	19.600	23.000
3	27.150	21.800	21.700	16.400	24.600	18.200
5.8	20.350	14.150	15.700	19.350	17.750	9.200
12	13.350	16.350	15.750	11.450	12.050	16.000
22	13.250	8.000	12.700	6.800	7.900	6.700
44	6.000	8.300	6.650	7.000	4.950	6.950
84	7.880	8.500	3.680	4.920	3.420	4.350

Conc-g/ha	Transform: Untransformed					t-Stat	Critical	Isotonic		Mean	N-Mean
	Mean	N-Mean	Mean	Min	Max			MSD	Mean		
negative control	21.175	0.9563	21.175	16.350	28.600	22.879	*	21.408	1.0000		
adjuvant control	22.142	1.0000	22.142	19.450	26.850	12.543					
3	21.642	0.9774	21.642	16.400	27.150	18.302	6	-0.247	2.383	4.508	21.408 1.0000
*5.8	16.083	0.7264	16.083	9.200	20.350	25.320	6	2.691	2.383	4.508	16.083 0.7513
*12	14.158	0.6394	14.158	11.450	16.350	15.202	6	3.709	2.383	4.508	14.158 0.6613
*22	9.225	0.4166	9.225	6.700	13.250	32.080	6	6.316	2.383	4.508	9.225 0.4309
*44	6.642	0.3000	6.642	4.950	8.300	16.830	6	7.682	2.383	4.508	6.642 0.3102
*84	5.458	0.2465	5.458	3.420	8.500	40.098	6	8.307	2.383	4.508	5.458 0.2550

Auxiliary Tests		Statistic	Critical	Skew	Kurt	
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)		0.98434	0.942	0.21003	-0.0342	
Bartlett's Test indicates equal variances (p = 0.08)		11.1863	16.8119			
The control means are not significantly different (p = 0.68)		0.42403	2.22814			
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSD _U MSD _P MSB MSE F-Prob df	
Dunnett's Test	3	5.8	4.17133		4.50833 0.21291 262.278 10.7388 3.7E-11 6, 35	
Treatments vs NEG-negative control						

Linear Interpolation (200 Resamples)						
Point	g/ha	SD	95% CL(Exp)	Skew		
IC05	3.563	0.991	0.000	4.934	-1.1299	
IC10	4.126	0.949	0.857	6.786	-0.2667	
IC15	4.689	1.113	1.735	8.892	0.9076	
IC20	5.251	1.518	2.532	11.076	1.3561	
IC25	5.887	2.249	3.369	13.973	1.0581	
IC40	14.662	2.667	5.219	19.601	-0.7380	
IC50	19.002	2.771	13.387	28.879	0.9326	



Dose-Response Plot

